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SPECIAL ISSUE • Evidence and meaning in policy making

research

Scientific data and its limits: rethinking the use of evidence in local climate change policy

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Climate policy is typically seen as informed by scientific evidence that anthropogenic carbon emissions require reducing in order to avoid dangerous consequences. However, agreement on these matters has not translated into effective policy. Using interviews with local authority officials in the UK's East Midlands region, this paper argues that the ideas, arguments and data informing local climate policy have been grounded in evidence from the natural sciences. Focusing on carbon emissions data demonstrated a consensus around scientific knowledge, not local policy responses to this knowledge. Acknowledging this 'mistaken consensus' provides the potential to utilise evidence more attentive to local contexts.

key words climate change • local government • evidence-based policy • performance management

Introduction

[G]uidance of modern society will fail as long as it tries to circumvent politics. (van Gunsteren, 1976, 150–1)

The UK 2008 Climate Change Act transformed a global policy issue into national legislation, establishing unprecedented targets for reducing emissions, namely 'that the net UK carbon account for the year 2050 is at least 80% lower than the 1990 baseline'. Reducing carbon emissions was justified by scientific evidence. The target itself was chosen by policy makers. The Act marked a landmark in the development of climate policy, and 'a tremendous success' for the environmental groups who had

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campaigned to have such targets enshrined in law (Big Ask, 2008). However, the scale of the ambition raises the question of whether the targets could be achieved.

In a policy area dominated by global and national approaches, this paper examines local authority climate policy within the UK region of the East Midlands in the period after the Act's introduction. I argue that conceiving of local climate policy as being driven and measured in terms of national carbon emissions hampers its chances of being supported by strong evidence. Following Weiss's (1991) tripartite typology of evidence – ideas, arguments and data – I show the role evidence played in the formulation of local climate policy from 2008–11. I identify a prevailing notion in climate policy that emissions reduction should be the primary aim, as suggested by evidence on climate change trends from the physical sciences. This notion dovetails with managerial forms of local governance in the UK, emissions reduction being a policy goal amenable to performance management regimes. In uncovering the meanings of local climate policy and the evidence informing it, more fruitful, oblique strategies for future climate policy become apparent.

This paper has five main sections. First, there is a review of literature, placing Weiss's framework in the context of critical studies of climate policy and knowledge. Following a brief review of research methods, the evidence framework is explored in more detail, with discussions of ideas, arguments and data within local climate policy. In particular, the section on data offers theoretical development on Weiss's framework by demonstrating the difference between data that commensurate (defined as the establishment of a common means for measuring different objects and practices in society) and those that mark (Espeland and Stevens, 2008). In conclusion, the paper reviews the findings and identifies potential futures for research and policy practice.

Evidence and climate policy

Climate change was first an issue of climate science. But climate change is now mostly a political process... (von Storch, quoted in Hulme, 2013, ii)

This insight by a prominent climate scientist highlights two widely agreed aspects of the climate debate. First, the agenda was initially set by science, with two centuries of research developing into an understanding that climate change could be dangerous to humans (Hansen et al, 1981; Hulme and Turnpenny, 2004; Kellogg, 1987). Second, from this understanding climate change emerged as a political issue in 1988, the year of Professor James Hansen's testimony to US Congress and the formation of the Intergovernmental Panel on Climate Change (IPCC) (Jaspal and Nerlich, 2014). This suggests a linear relationship between scientific evidence and policy developments within climate change. However, both empirical work into the influence of research on policy and insights from interpretive theory have come to question such a relationship (Greenhalgh and Russell, 2009; Majone, 1989; Sanderson, 2003; Sullivan, 2011). One key scholar in this literature, Carol Weiss (1991), unpacks the idea of evidence as a singular category, instead proposing a typology of argument, ideas and data, reflecting different assumptions about policy making and different conditions for them becoming influential on policy (Table 1).

Weiss's framework opens up the notion of evidence to categories beyond research data, highlighting how issues of concern enter policy agendas and how policy responses

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Table 1: Weiss’s typology of policy research

Type of evidence	Definition	Assumptions about policy making	Conditions for influence
Ideas	Research findings transmuted into generalised ‘story’	Humanistic; problem formulation may not match requirements of decision makers	Early stages of policy discussion; high uncertainty
Arguments	Data used selectively for policy advocacy	Adversarial decision making	Conflictual areas; ongoing legitimization of decisions
Data	Reports heavy on data and interpretations	Technocratic, little goal conflict	Value and goal consensus

Source: Adapted from Weiss (1991, 37–42)

to those issues are shaped. This chimes with literature in science and technology studies which, while often reaching different conclusions, questions the assumption that scientific evidence alone can drive climate policy (Eastin et al, 2011; Grundmann and Stehr, 2012, 119–78; Jasanoff, 2010; Pielke Jr, 2007; Sarewitz, 2004; Wynne, 2010). Sarewitz (2011, 476) provides a succinct account of this argument, outlining ‘the plan’ implicit in the development of climate science and policy:

Broadly speaking, the plan has two familiar components. The first component is that scientific knowledge about climate change, widely disseminated through society, will lead to action that will allow society to effectively confront and resolve the problem. Science will lead to action by compelling a convergence of people’s world views around the need to take action.

But what action? The second component of the plan is that this convergence of understanding will translate into a consequent convergence around what needs to be done. In this case, action has come to mean reducing greenhouse gas emissions and especially fossil fuel consumption, in order to minimize human interference with and disturbance of the global climate system, thus in turn reducing the negative impacts on society due to this disturbance of the climate.

In identifying scientific knowledge as central to the way climate policy has unfolded, Sarewitz (2011, 479) notes that the reports of the IPCC came to implicitly endorse the international emissions control and monitoring regime being negotiated within the United Nations Framework Convention on Climate Change (Miller, 2004). Crucially, both of these processes are global in scope, contributing to the dominant framing of climate change as a scientific problem on a planetary scale which underplays the diversity of contexts and circumstances affecting citizens’ perspectives on the issue (Demeritt, 2001, 329). This insight underlies this paper’s analysis of local climate policy. This intertwining of research findings and policy advocacy fits into Weiss’s evidence typology as argument, making ‘a tidy package for use in bureaucratic or legislative negotiations’ (1991, 39). The convergence around understanding and what needs to be done, identified by Sarewitz, is akin to the value and goal consensus identified by Weiss as the conditions for data becoming influential as evidence (see Table 1):

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Table 2: Weiss's typology applied to climate policy

Time	Type of evidence	Use in climate policy	Relation to Weiss typology
t ¹	Idea	Climate change as serious problem caused by humans	Translation of scientific evidence into simple 'story'
t ²	Argument	Reduce carbon emissions to address problem	Advocacy of particular policy to tackle the problem
t ³	Data	Monitor and manage carbon emissions	Consensus over policy response leads to focus on emissions data

value consensus that scientific knowledge shapes our understanding of the world and what courses of action we should take, leading to a consensus on the goal of reducing carbon emissions and a shift to carbon emissions data as an influential form of evidence. Table 2 summarises the role of idea, argument and data in climate policy,

Critics of these developments point to a 'short-circuiting' of the move from idea to argument shown in Table 2. In translating largely undisputed matters of fact, such as the physical processes of the greenhouse effect, into political matters of concern, climate change is articulated as a global crisis beyond dispute (Swyngedouw, 2010, 217; following Latour, 2004). For Swyngedouw, this is a manifestation of a post-politics, where managerialism reigns and expert knowledge predominates over political position (2010, 225). Such managerialism has become increasingly important within local government since the 1980s (Andrews et al, 2005, 640; Hood, 2006; Wilson and Game, 2006, 361–4). A focus on quantitative measurement of carbon emissions proved more amenable to managerial modes of governance than previous iterations of environmental policy, such as sustainable development, which focused more on the linkages between the environmental and the social (Cohen et al, 1998, 359).

This section has introduced Weiss's typology of evidence, and discussed it within the context of critical literature on the evolution of climate policy. In particular, it has established three principles for the exploration of the use of evidence within local climate policy. First, scientific knowledge has played a central role in the framing of climate policy. Second, this knowledge has been conceived of, and articulated at, a global level. Third, these characteristics have in turn driven an approach to climate policy centred on the management of carbon emissions. All of these play an important role in the exploration of ideas, argument and data in local climate policy which follows.

Research methods

This paper draws on conversational interviews undertaken with two categories of participant from the nine unitary and upper tier local authorities in the UK region of the East Midlands:

- the climate change manager (CCM) responsible for overall climate policy within each of the nine local authorities.
- elected councillors (Cllrs) whose portfolio included climate policy (the exact composition of these portfolios varied between local authorities). The councillors interviewed were from a smaller sample of four local authorities.¹

Participants were interviewed in two waves of ‘cultural’ and ‘topical’ interviews (Rubin and Rubin, 2005, 9–11).² The first wave of interviews (June 2010–March 2011) were cultural; that is, participants explained the generalities of behaviour, norms and values with agenda-setting by the interviewer kept to a minimum. The second wave of interviews (March–August 2011) were more topical in style, piecing together the participant’s narrative of issues already highlighted by themselves and others as significant. This mix of styles enabled a focusing down on particular topics between the first and second interviews, and facilitated cross-checking of meanings between different participants. Care was taken to allow participants to present the elements of their story which they regarded as significant, while allowing the researcher time to probe some of the unspoken assumptions lying beneath the surface (Stephens, 2007, 206). Interview transcripts were coded thematically, recognising that this was a process of interpretation rather than a mirror on reality (Yanow, 2000, 87).³ The anonymous quotes used here are representative of the wider corpus of data.

Evidence 1: ideas

I have argued that scientific knowledge about climate change has been assumed to motivate policy action. This has been evident in the close relationship between IPCC reports and negotiations through the United Nations. In this section, I argue that this global *modus operandi* has also been evident within the UK at national and local levels. This is exemplified by comments on the IPCC’s report on the physical science basis for climate change in 2007, by the then Environment Minister, David Miliband:

The report confirms our concerns that the window of opportunity to avoid dangerous climate change is closing more quickly than previously thought... showing that the debate over the science of climate change is well and truly over. What’s now urgently needed is the international political commitment to take action to avoid dangerous climate change. This has been absent so far.... This first report by the IPCC, and others to follow later this year, can provide a strong evidence base needed to move the prospects of agreement closer. (DEFRA, 2007)

Miliband clearly states the perceived importance of climate science as a motivator for action. A report on the physical science basis for climate change is portrayed as the evidence needed to stimulate ‘political commitment’ where none previously existed. Underlying this logic is an assumption that the variable within the physical science evidence which is influenced by humans – carbon emissions – is that which should be targeted by climate policies. Indeed, within the UK government this assumption appeared warranted, with the passing of the 2008 Climate Change Act, which established a governmental duty ‘that the net UK carbon account is at least 80% lower than the 1990 baseline’. In addition, the Act states that this duty can only be amended following ‘significant developments in scientific knowledge... or international law’. The policy goal established by the Act foregrounds carbon dioxide and its universal, predictable properties, while skirting the socioeconomic context of emissions (Demeritt, 2001, 313).

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These national developments influenced local climate policy, with carbon dioxide emission targets introduced as part of the National Indicators (NIs) framework for monitoring local government progress on priority policy areas (DCLG, 2008, 5–7). Such targets were presented as a means for local areas to contribute to the carbon budgets introduced by the Climate Change Act (EMCCP, 2009, 3). Targets were negotiated between local authorities, stakeholder organisations and the regional Government Offices (satellites of central government departments) as part of Local Area Agreements. These agreements set local policy priorities for the period 2008–11 with targets measurable using NIs (DCLG, 2008, 5). From a total of 198 NIs, two dealt with carbon dioxide emissions, as shown in Table 3 (DCLG, 2008, 12).

Table 3: Definitions of National Indicators relating to climate change mitigation

NI	Title
185	CO2 reduction from local authority operations
186	Per capita reduction in CO2 emission in the local authority area

Source: DCLG, 2008, 51

NI185 had a narrow focus, reporting only emissions from a local authority's own operations (DECC, 2009a, 55). NI186 was broader, measuring area-wide carbon dioxide emissions per capita omitting large point emissions sources which were judged to be beyond the influence of local authorities, such as motorways and members of the EU Emissions Trading Scheme (for example, large power stations) (DCLG, 2008, 51). Such was climate change's rapid rise to prominence at that time that it was the fifth most selected policy priority in such agreements (Audit Commission, 2009, 18), proving more popular than established issues such as crime, childhood obesity and education (Schroeder and Bulkeley, 2009, 324). Out of 150 Local Area Agreements within England, 100 set targets for the reduction of either NI185 or NI186 (Eadson, 2008, 140). The enthusiasm for adopting climate change measures reflected 'an expansion in the consciousness, intent and, perhaps, commitment, on the part of local authorities in general to "do something"' (Footitt, Wood, and Turnpenny, 2007, 24).

The East Midlands appeared to show a particularly strong consensus to 'do something' in response to the scientific evidence for climate change and the political targets formulated on the basis of it. It was the first English region to have all of its local authorities sign the Nottingham Declaration, a voluntary commitment to address climate change locally (EMCCP, 2009, 3). All nine of the region's Local Area Agreements included climate change mitigation indicators, seven opting for NI186 and two for the narrower NI185 (EMCCP, 2009, 15). NI186's area-wide focus offered the advantage that it included the local authority operations measured by NI185, enabling local authorities to get 'both indicators... for the price of one' (Pearce and Cooper, 2011, 209). However, local authorities had significant concerns over NI186 which, although not dissuading many from adopting the indicator, were to play a role in the subsequent interpretation of the climate change agenda.

These developments appear to support the framework for influential evidence proposed in the previous section, with climate change moving from an object of scientific enquiry to become a powerful social, political and cultural idea (Hulme, 2009, 61–70). The next section critically analyses the political arguments for local

carbon emission reduction which flowed from the idea of climate change, arguing that while a consensus emerged within local areas around the scientific idea of climate change, this was not the same as political convergence about how to respond.

Evidence 2: arguments

In her depiction of the intertwining of research and advocacy as argument, Weiss highlights the political dimension of evidence-based policy, particularly in conflictual policy debates. However, as already argued, climate policy in the late 2000s had the appearance of a policy issue becoming characterised by consensus rather than conflict. Decades of complex research in various branches of climate science had been transmuted into a simple story for policy makers: carbon dioxide emissions from human activities are changing the earth's climate with potentially dangerous consequences for society. However, the consensus within East Midlands local authorities that climate change was a problem did not translate into agreement on what should be done about it and, in particular, how emissions should be reduced. A survey of inner-city, suburban and rural households elsewhere in the UK shows how public commitment to action was often thin, focusing on 'easy' measures such as recycling at the expense of more 'difficult' steps such as energy conservation or reducing car use (Whitmarsh, 2009, 21). In addition, overall public interest in a number of public policy issues, including climate change, waned after 2008 in the wake of the financial crisis (Climate Sock, 2010).

Interviews with local authority actors supported the notion that public support for climate change policy may have been weaker than previously thought. None of the elected councillors interviewed with responsibility for climate policy described the issue as one which voters remarked upon 'on the doorstep'. The issue proved not to have the same resonance for members of the public and, by extension, local authority councillors, as managers focused on the longer term. One councillor expressed the view, echoed by councillors in two other local authorities, that this disjoint between the perspectives of managers and the public was an issue when it came to securing support for action:

I'm not necessarily 100% popular with my officers for this view, but if you walk out and say to somebody on the street out there, "we're going to save the planet by cutting down CO₂, right?" I don't think you're going to get an amazing amount of people leaping up and down about that. (LA2 Cllr interview 1)

As well as noting public apathy on climate change, this quote underlines the disjoint between expert and lay opinion. While climate change had been prioritised as an overarching theme by many local authorities, its peripheral status within public concerns left it short of political support in an environment of increased public and media scrutiny of local authority expenditure. Managers who were personally convinced of the need for strong local climate change policies also came to recognise this gap:

I think that's one of our problems with the general public, we talk glibly about climate change. Why do they need to bother about climate change? They just need to know about practical things they can do which can help

them improve their quality of life, and that can be energy efficiency, saving a bit of money on your fuel bills. I just think we put ourselves on a pedestal with this and don't really understand what's happening around us and how our customers view this agenda. (LA3 CCM interview 1)

This gap can be explained by a divergence between the global framing and local understanding of climate change. As outlined above, the issue became established as a policy priority in the 2000s, with climate change becoming a commonly used label in the public lexicon (Nerlich et al, 2010, 97–9). While this helped establish the understanding of climate change locally, its policy mobilisation through NI186 reinforced its dominant framing as scientific in the discussion of causes and managerial in the discussion of solutions. As a result, climate change did not hold significant meaning for individuals thinking about their everyday existence in the local environment.

While a focus on climate science established the conditions for consensus, it elided the political, and inherently conflictual nature of how to reduce emissions:

By excluding any obviously, social or political matters, the scientific reductionism of CC [climate change] makes consensus possible, but the result is, in some sense, irrelevant. *The things that can be known with scientific certainty are not necessarily the most important to know.* So, for example, the science of CC can agree about the physical sources of carbon emissions, but only by refusing to consider the far more important and deeply political question of why they are increasing and how (or if) they should be curtailed. (Cohen et al, 1998, 360–1, emphasis added)

This short-circuiting of the translation from scientific facts into public concerns forecloses political argument in favour of the type of managerial approach exemplified by NI186 (Swyngedouw, 2010). However, as Weiss notes in her discussion of types of evidence, political argument is necessary '[i]n order to bring along the organizations and individuals who will carry out decisions, there is a continuing need for legitimation' (1991, 42). So while sidelining conflict may appeal to political elites, it may be impossible to sustain democratic support for policies without such conflict (Machin, 2013, 101–103). This was reflected in a national survey finding that only 35% of local authorities were maintaining the same commitment to climate change work following budget cuts and the demise of Local Area Agreements (LAAs) in 2010 (Scott, 2011, 14–15).

This section has shown that the argument for focusing on emissions reduction inherent in 'the plan' didn't enjoy the levels of political support suggested by local authorities' early commitments to the Nottingham Declaration and their subsequent adoption of emissions targets as climate policy evidence. The next section examines this disjoint in detail, highlighting the divergent meanings of emissions data between central and local government.

Evidence 3: data

This section focuses on NI186, the measure of area-wide emissions selected by the majority of East Midlands local authorities. Weiss's framework helps us to understand

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why data became important as a consensus appeared to emerge that climate change was a priority issue. However, further work is required to uncover the meaning of this evidence selected to inform local policy. In particular, this section distinguishes between numerical data that commensurate and those that mark. Counting can be a means of commensuration, establishing a common means for measuring different objects (Espeland and Stevens, 2008, 408). These metrics can be ordinal, like league table rankings, or ratio measures, like carbon dioxide emissions. Alternatively, counting can be a means of marking a category (Espeland and Stevens, 2008, 407). For example, numbers on the back of footballers' shirts identify the players, both individually and as part of a particular team, but the numbers do not have a metric relationship to each other; the numbers do not relate to the players' relative skill levels. This section shows how NI186 data was intended by central government to commensurate carbon emissions in the spirit of 'the plan', but was regarded by local government managers only as a means of marking climate change as a policy priority.

Data that commensurate

As argued above, the decision to count a particular object reflects the preferences of those in positions of power within the policy process, rather than a value-free decision of selecting the 'best' evidence. That central government introduced an indicator (NI186), which measured the totality of carbon emissions within local areas was unsurprising, given the linear relationship assumed between climate change problem and solution, as well as between science and policy. As outlined in the previous section the knowledge that climate change is caused by rising emissions was assumed to imply a singular focus on emissions reduction. While this is accurate from a natural sciences perspective, such logic produced different meanings within the social practice of public policy. In focusing only on carbon emissions, NI186 emphasised the chemical by-products of various social practices while erasing almost all the social context for such emissions (other than population size). Carbon emissions are pervasive; it is hard to imagine any practices that do not entail such emissions of some kind. As a result, NI186 commensurated a gamut of social activities and judged them in terms of their carbon emissions alone. No distinction was made, for example, between car emissions in a city, where public transport options are likely to exist, and in a rural area, where such alternatives are likely to be in scant supply. For central government this commensuration made sense within 'the plan' of translating evidence from the natural sciences into public policy, but such a logic made less sense to local climate policy managers for two reasons: misgivings about the data and a dearth of policy 'levers' to affect emissions.

First, NI186 excluded local actors from the production of data, engendering suspicion in data accuracy. One manager held a general scepticism about the accuracy of area-wide emission measures:

The robustness of that data is very questionable anyway. You're carbon footprinting the... [whole area]. There's so many inaccuracies with this whole exercise when you're trying to carbon footprint your own authority, let alone an area. You factor that up, it's just quite mindboggling. (LA3 CCM interview 1)

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Another manager focused on the similarities between the emission trends of different local areas, casting doubt on the 44% of data derived from disaggregated modelling:

If you look at the data, nearly everywhere follows the same sort of trajectory, which makes you wonder. Obviously it's a difficult thing to put statistics together on, but it's just a bit odd that all the trajectories are exactly the same. And there's so much top-down disaggregated stuff isn't there, rather than aggregating actual impact from the community areas. (LA1 CCM interview 1)

While such misgivings about the data were common amongst managers, they did not invoke any statistical analysis of their own to counter the NI186 methodology. Instead they used their own local experiences and observations as the basis for scepticism, reflecting criteria established in the literature for lay judgement of expert opinion (Wynne, 1992, 298). While local authority officers could be termed 'expert' on policy, this expertise did not extend to data collection. When asked about the details of a project to collect local carbon data, one officer replied "I don't know how you go about doing it, that's why I get experts to do it" (LA4 CCM interview 1). In one local authority adopting NI186, the manager attempted to address negativity over the data by commissioning their own study of local area emissions based on a more 'bottom-up' methodology. The data that resulted from this study, carried out by a local university, was largely consistent with the existing NI186 data. Despite this apparent confirmation of data quality from a local source, the manager continued to take a dim view of the reliability of the centrally produced statistics:

We had a lot of very good local carbon data which actually cross-referenced against the data produced for 186, and it was pretty similar... [But] to be basing the whole of our targets on 186 data is not reliable. (LA4 CCM interview 1)

The persistent scepticism about data reliability, even after the corroborating 'second opinion' from a local expert source, suggests managers held an inherent distrust of centralised data production, regardless of the statistical validity of the data itself. The introduction of NI186 was intended to move power and responsibility from central to local government, but the means of monitoring progress remained controlled by central government. The NI framework made a virtue of the small number of new datasets required from local authorities to report performance, which Whitehall described as 'reducing data burdens' on local government (DCLG, 2008, 22–3). This may have eased a strain on local government resources, but also contributed to disengagement with NI186, as managers saw the indicator's methodology as beyond their capacity to influence. One manager expressed a feeling of passivity when referring to the NI186 data as being "pumped out to us every year" (LA3 CCM interview 1), reflecting the distance felt between centrally-compiled scientific data and local context.

Local authorities were also unable to check NI186 data before publication due to pre-release secrecy rules for official National Statistics (DECC, 2011, 5). The centralisation of data production fostered a lack of understanding and suspicion in NI186 from the very people whom it was intended to help, local climate change managers. Together with NI186's methodological complexity this left the data

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production appearing to local managers as a ‘black box’ closed to the contribution of local knowledge. While central government had good intentions of producing a consistent dataset and reducing local authority burdens, their actions occasioned a negative local perception of NI186, which in turn provided the context for weak implementation of climate change mitigation policy.

Second, suspicion of centrally produced data was a manifestation of a wider worry for local managers: a lack of control over policy. There was a widely held view that local authorities’ scope for influencing emissions was tiny in comparison to the potential for central government action:

I don’t think what we’re doing in that plan is going to have much effect on it, it’s only ever going to have a 1% impact. The government must recognise it has a lot more power to affect carbon dioxide emissions. (LA5 CCM interview 2)

The impact a local authority can have in terms of area-wide emissions is minimal. The biggest impact anyone can have is national government in terms of policy and fiscal measures. (LA3 CCM interview 1)

These views were supported by central government reports showing that local policy measures would have no influence over the majority of an area’s emissions. While there was considerable uncertainty about the degree of influence local authorities could exert over category 2 (Table 4), the overall picture was one of local performance under NI186 being largely determined by national policies. One official estimate was that categories 2 and 3 in Table 4 would total a reduction of only 5.1% between 2005 and 2010 (DECC, 2009b, 56). This compared with East Midlands local authorities’ aggregated target of a 10% reduction over the same period (EMCCP, 2009, 15), suggesting that local authorities had influence over only half of the emissions they had committed themselves to reduce. This contradicts a fundamental of performance management, that an indicator should have controllability and measure only what is the responsibility of the manager (Jackson, 1988, 12). Instead, local managers had no influence over 71.2% of NI186 emissions, with less than 3% of emissions being purely influenced by local measures, although these were the responsibility of the local partnership, rather than the local authority manager.

Table 4: National policy exerts the greatest influence over local emissions measured by NI186

	Category of policy measures with influence over local carbon dioxide emissions	%
1	Purely national measures but still influencing community emissions	71.2
2	National measures for which local authority influence can improve performance	25.9
3	Purely local measures implemented by local authorities or other organisations	2.8

Sources: AEA Technology, 2008, 36; Eadson, 2008, 146

So, to commensurate a local area’s carbon emissions may have appeared a logical translation of scientific knowledge into policy-relevant evidence, but it excluded

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local knowledge about both the contexts for such emissions and the ability of local authorities to exercise control over the sources of such emissions. However, seven out of nine East Midlands local authorities adopted NI186 despite recognising the data's flaws as effective evidence for policy. The next section explains this apparent puzzle as a divergence of meaning between central government and local authority managers. For the latter, the meaning of NI186 was to mark the importance of carbon emissions rather than a trustworthy way to commensurate such emissions.

Data that mark

Agreement about the idea of climate change as a policy priority has already been demonstrated as the East Midlands became the first region to have all of its local authorities sign up to the Nottingham Declaration, a voluntary commitment to addressing climate change locally (EMCCP, 2009, 3). While signatory authorities were far from sure to follow up this action with a coherent climate change strategy (Carty and Hislop, 2007, 8), it underscored the increased public awareness of the issue prompting local councillors to respond with a statement of intent (House of Commons Environmental Audit Committee, 2008, 20–21). This response was reinforced by 'wilful individuals' working within local authority environment units, who developed expertise and enthusiasm working on Local Agenda 21 throughout the 1990s and seized on climate change as a new manifestation of the sustainability agenda (Centre for Sustainable Energy, 2005, 20–22). Local authorities' engagement with the agenda implied a willingness to adopt an indicator measuring area-wide emission reduction, but this jarred with the flaws in NI186 outlined above. The resulting dilemma was summarised by one local authority manager familiar with the LAA negotiation process:

Our view was when 186 came out, well we're not going to say no because we've been asking for this for a very long time, but a) we have no resources, and b) we have no control. (LA6 CCM interview 1)

While two local authorities felt strongly enough about NI186's weaknesses to reject it in favour of NI185, most did not want to back away from the more ambitious NI186. However, demonstrating credibility to central government and the public was not the only salient issue in indicator choice. In selecting NI186, local authorities prioritised its symbolic importance over the flaws in its design to demonstrate that carbon dioxide reduction was a local priority within an institutional context. To do this, carbon emission reduction had to be established within local government's performance management regime. By including NI186 within their LAAs climate policy became mainstream and justified the allocation of resources to it:

NI186's power is to raise the profile of climate change within a formal performance management structure. The fact we have NI186... within our LAA is a good indication of our commitment to the climate change agenda. (LA4 CCM interview 1)

Climate change managers seized the opportunity of raising the issue's priority within their local authorities. By introducing NI186 into performance management

frameworks, climate change would no longer be seen as an issue of fringe concern. For central government and senior management in local authorities, the meaning of NI186 was the transformation of climate change into an area of policy that could be measured and managed in the same way as others within the existing performance management regime:

It's meaningless really but the politicians and performance management people for the LAA use it [NI186] as "Have we passed or not?" (LA3 CCM interview 1)

From the perspective of this climate change manager, NI186's flaws turned the data into 'meaningless' evidence. Instead, it was the very acts of measurement and monitoring that were important, as they gave climate change new meaning as a mainstream policy concern for local authorities and created the space within which they could introduce new programmes. This meaning emerged as a result of the acts themselves, rather than the data they produced. Returning to Espeland and Stevens's (2008, 407) analogy of shirt numbers signifying, but not rating, footballers, NI186 ensured that climate policy was 'in the game' of local authority performance management. NI186 data was adopted not as a source of evidence but as a marker of the importance of climate change.

This section has analysed the use of data as evidence for local climate policy, supporting Weiss's observation that data becomes influential in conditions of goal consensus. The category of 'data' has been unpacked, noting that NI186 had different meanings for central government (commensuration) and local climate managers (marking). This insight is key in understanding the 'mistaken consensus' in climate policy, the difference between agreement that there is a problem and agreement about what to do about the problem. While central government looked to stick to 'the plan' of managing carbon emissions, local authority managers were aware that basing their climate policies on this data was inappropriate in terms of both their own power to influence events and the need to maintain political support.

Conclusion

At the beginning of this article, it was argued that the local dimension of climate policy is under-researched, and in particular that there is an absence of literature examining the meaning of evidence employed for such policy. This article has filled the gap by unpacking the theoretical concept of 'evidence' into three categories: ideas, arguments and data. It has highlighted the importance of climate change's framing as a global policy issue informed by evidence from the natural sciences, and how this framing contributed to the adoption of local-area emissions despite the reservations of some local authority managers. While NI186 and the wider indicator set have now been abolished, these findings remain relevant as local authorities continue to report their emissions to central government and emissions data remains at the heart of UK climate policy. Future research into local climate policy should not take a prioritisation of emissions reduction as read. Rather, an unpacking of the different types of evidence used to inform policy should be at the heart of attempts to evaluate policy success.

The paper has demonstrated the usefulness of Weiss's evidence framework as a starting point in determining how local climate policy came to be defined in the

late 2000s, while also offering theoretical improvement through a treatment of data that acknowledges the potential for actors to ascribe different meanings to the same data. While the notion that data does not speak for itself is familiar in interpretive policy analysis (Stone, 2002, 163–87; Yanow and Schwartz-Shea, 2006, xvii–xix), it bears repeating in climate policy which continue to rest heavily on quantitative data. While scientific knowledge in climate change has established the issue's importance, its translation into evidence as data that commensurates has not equated to practical policy knowledge (Grundmann and Stehr, 2012, 175). That many localities adopted such data regardless, highlights how the demands of managerialism can prevail over politics.

To date, local authority managers have let their climate policies be guided by global discourses of emissions reduction. Managers' doubts about measuring emissions locally, in conjunction with evidence that global climate policies are not having the desired effect (Prins et al, 2010), points to the possibility of a different course. Rather than focusing directly on climate change in the belief that it is a problem tameable (that is, not wicked) through managerial governance, a more oblique strategy could address policy areas for which climate stewardship is a contingent benefit (Rayner, 2010; Sarewitz and Pielke Jr, 2000; Sarewitz, 2011; *The Economist*, 2010). These kindred policies would not have emissions reduction as their first order priority, but trade adherence to a global framing of climate policy for feasibility within the financial and political constraints local authorities find themselves under (Pearce, 2013, 209–35). These could include improved public transport provision, greater use of district heating schemes, improved domestic energy efficiency and continued reduction of rubbish sent to landfill. Political support can also be harnessed for ongoing work adapting to future risks exacerbated by climate change. In all of these cases local political support can be harnessed more readily through immediate, tangible benefits.

This suggests a more fluid movement between ideas, argument and data than the chronology suggested earlier in this paper (Table 2). The current focus on data does not appear to be delivering local results, suggesting that either new arguments or ideas should return as evidence to inform policy. A shift back to finding political arguments focusing on policy responses is called for, rather than the mere acceptance of scientific data. Without such a shift, it may be that new evidence to drive climate policy comes in the form of changing ideas rather than arguments. If the idea of climate change changes from something requiring recognition to something to be left to its own devices, then climate policies will suffer a more grievous blow. In short, it may be difficult for some to accept a more politically palatable, oblique approach to climate policy. However, if better political arguments for action cannot be mounted, the alternative may be the disappearance of climate change from policy agendas altogether.

Notes

¹ This 'information-oriented' sample (as opposed to random), was selected with reference to local authorities' priority National Indicators, and whether they were urban or rural (Flyvbjerg, 2006, 230).

² On one occasion, an incumbent councillor could not be interviewed for personal reasons.

³ For additional information about research practice, see Pearce (2013, 99–138).

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