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Hannah Knox

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Footprints in the City: Models, Materiality, and the Cultural Politics of Climate Change

Hannah Knox, University of Manchester
ESRC Centre for Research on Socio-Cultural Change

ABSTRACT
This article traces the ways in which climate change, conceived as a socio-material process, works to produce new objects and subjects of political intervention. Building on the idea that climate change has become constructed as a particular kind of population-induced energy crisis, the article explores how the social problematic provoked by anthropogenic climate change relates to “biopolitical” understandings of the relationship between the state and the individual. In doing so, it aims to make a contribution to the broader discussions within this special collection regarding the transformative politics indexed by the term “energopower” and its co-articulation with the more familiar concept of “biopower.” [Keywords: Energy, climate change, population, biopolitics, governance, numbers, models]

This special collection sets out a compelling argument for the need for anthropologists to interrogate the infrastructures, materialities, and economics of energy as a key dynamic in the formation of contemporary forms of social and political organization. As Boyer notes in the introduction to this special collection, the twin problems of peak oil and climate
change have in the past decade prompted anthropologists, geographers, and sociologists to return anew to questions posed by earlier generations of scholars regarding the dynamics by which energy is produced, circulated, and consumed (e.g., White 1943, Nader 1981). This renewed interest in energy politics has begun to lead to some fascinating analyses of how the social organization of energy in the 20th century came to operate both as the foundation of modern economies and states and to participate in the formation and transformation of social identities and cultural relations more broadly.

The focus of some of the most interesting work on energy politics has been on the interplay between the materiality of energy and the way in which this nonhuman materiality has come to interface with social processes (Barry 2013). If an attention to energy has shifted the discussion of politics—and in particular biopolitics—in any single direction, it has been to confirm that political life is irresolutely tied to nonhuman material substances (Collier 2011, Stengers 2010, Bennett 2010). Campbell (2005), for example, argues that we cannot understand American culture and society if we do not consider the central role that oil has played in making an American subjectivity that is intimately tied to a regime of “automobility.” Similarly, Mitchell’s (2011) work on carbon democracy has provided a compelling argument that energy has been an underexplored foundation of contemporary political systems.

This article aims to provide an intervention into discussions about the social and material manifestation of energy-relations by shedding light on some of the political ramifications of one of the ostensible causes of the recent return to energy as a subject of anthropological interest—the specter of anthropogenic climate change. The article builds on 18 months of ethnographic research conducted in Manchester, UK with a network of people who have been attempting to effect a city-wide reduction in carbon emissions as a means of intervening in the problem of global climate change. The focus of the ethnography has been an attempt to understand the way in which the problem of climate change is currently imposing on the practical activities of those who are trying to manage the climatic implications of the current structure of energy provision in the UK. In conducting this research, I have followed in the footsteps of scholars like Mitchell (2011) and Campbell (2005) in taking an explicitly socio-material approach to the appearance and operationalization of climate change as a matter of political concern.
If my attention in this research has been on the intertwining of social and material processes, my aim in pursuing this approach has been to open up an understanding of the cultural politics of climate change which moves beyond either an analysis of the social effects of climate change in terms of the impact of external environmental conditions on specific people’s livelihoods, or a social constructionist approach to climate change as a purely “cultural” phenomenon. The aim of my research has been, rather, to interrogate the way in which climate change as a material-political phenomenon has participated in reconfiguring new areas of intervention in people’s lives. To this end, I have approached climate change as neither a natural process nor a cultural idea, but rather as a mode of social analysis, which involves the participation of weather, carbon dioxide, algorithms, spreadsheets, government officials, climate activists, and so on. From the vantage point of a particular city—Manchester—and a particular ambition—the reduction of carbon emissions—the social analytics of climate change is approached as an instance of the (re)formation of particular political relations and the re-imagination, or in Latour’s terms the reassembly, of “the social” (Latour 2005).

If one of the strengths of an anthropological focus on energy relations has been to draw attention to the interplay of the social and the material, one of the problems that this topic raises is how to account for the link between large scale material processes and situated social practices. The allure of an anthropological explanation of contemporary social life that tacks between material and cultural processes can easily slip into a kind of determinism where either material processes are seen to shape social relations, or social relations determine the shape of material processes, without an interrogation of how these relationships are constituted (for an extreme example, see White [1943]). This has certainly been the case in discussions about the relationship between administrative practices of carbon reduction and their implications for tackling climate change. Much of the debate about the influence of climate change on energy politics has focused on assessing the extent to which climate science and the administration of climate change have (or have not) been able to bring about a transition to low-carbon energy based economy (e.g., Lippert 2010, 2011). On the one hand, there are social practices, and, on the other, material effects.

At the same time, in a more radical analytical move, some scholars have begun to suggest that anthropogenic climate change should itself be of interest to social theory for the way in which it forces a reconsideration of the
analytical foundations upon which deterministic arguments like the above analysis are formulated (Latour 2004b, Chakrabarty 2012). Bringing together the social and the natural on a global scale, anthropogenic climate change by definition appears as a socio-material process, combining human activity and material transformations in a dynamic, systemic interplay which climate science is still trying to understand. If climate change has proved a complex challenge to the natural sciences, in recent years its implications for the human sciences have also begun to be considered, particularly in relation to the way in which it renders epistemology-focused forms of social theory inadequate to understanding this powerful social problematic (Serres 1995). For these theorists, the process of anthropogenic climate change is not only an interesting topic for anthropological analysis, but also figures as a new site for theoretical invention, promising to provide the seeds for a more nuanced sociological and anthropological analysis of the interplay between large scale social and material dynamics.

Prompted by this work, my aim in this article is to find a way of analyzing the social dynamics of climate change governance in order to better understand how the social and material are navigated in particular configurations of relations. By attending to the material politics of climate change, I am interested in the political ramifications of this process of navigation, acknowledging that the political effects that occur are not necessarily those that lead to actual reductions in carbon emissions. Rather than focusing on whether climate science has or has not led to a form of politics that is capable of bringing about low-carbon energy futures, I suggest that an interrogation of the specific techniques through which climate change articulates with broader processes of social transformation can provide a particularly fruitful way of understanding—in the language of this special collection—what we might call “energopower,” and thus of understanding the implications of climate change for political action. By moving away from an analysis of climate change science—which assumes that its capacity to effect politics lies in the ability of representations of climatic changes to seamlessly bring about a transition from high carbon to low carbon emitting energy sources (see Nordhaus and Shellenberger 2007 for a further critique of this assumption)—my article aims to understand the relationships at play in the attempts of people I have met in my own fieldwork to understand and engage with the problem of anthropogenic climate change. In doing so, the article attends, in particular, to the role of representation, enumeration, and modeling in this process.
In what follows, I explore the ongoing and necessarily political negotiation between materiality, representation, and action that takes place in the analytical work which permeates the governance of climate change. It is in the texture of analytical practices that I suggest new subjects and objects of political intervention are being rendered thinkable and operational. Within the governance of climate change as it is being played out in the UK, I suggest that not only are “climate” and “energy” being performatively and collectively reconfigured, but so too are some of the most powerful and foundational categories of contemporary political action, including society, population, and the individual. In the next section, I consider the role that analytical practices have played in bringing these concepts under scrutiny. I then move to consider the implications of some reconfigured analytical concepts for framing the sites within which climate change governance is expected to be able to take place.

**Numbering Effects**

A lost number in the equation.
A simple, understandable miscalculation
And what if on the basis of that
The world as we know it changed its matter of fact?

Let me get it right. What if we got it wrong?
What if we weakened ourselves getting strong?
What if we found in the ground a vile of proof?
What if the foundations missed a vital truth?

What if the industrial dream sold us out from within?
What if our impenetrable defense, sealed us in?
What if our wanting more was making less?
And what if all this wasn’t progress?

Let me get it right.
What if we got it wrong?

— Excerpt from Lemn Sissay “What If?” (2009)
These are the words of the Manchester poet Lemn Sissay, quoted by the chair of an event held in Manchester in 2012 with the title “We Need to Talk about Growth.” In the banked tiers of an underground lecture theater, about 150 people—academics, climate change activists, officers from the city council, students, and people working for environmental campaign organizations—are gathered to debate the ecological limits to economic growth, and to discuss possible means for developing an alternative model of engaging and governing the world.

Central to the discussion that ensues on the relationship between climate change and growth based economics is an attention to competing forms of measurement. The starting point of Lemn Sissay’s poem—the “lost number in the equation,” the “simple understandable miscalculation”—seems to penetrate to the heart of the debate in the lecture theater. Understanding the problems posed by climate change cannot be imagined without attending to practices of measurement, but perhaps, some people worry, measurement is also part of the problem.

One of the things that drew my analytical attention to the problem of climate change in the first place as a socio-material phenomenon was its inherently mediated character. As Paul Edwards (2010) has argued, the history of climate science is as much a history of computer modeling and simulation as it is a history of experimental science engaging with chemical and meteorological phenomena on the ground or in the air. Making climate change into a political reality has depended on the capacity of models to build increasingly fortified webs of evidence regarding the pattern of climatic changes, and the relationship between these changes and the emission of carbon dioxide into the atmosphere. Climate change has not so much been a scientific “discovery” as an ongoing process of fact-making that has transformed hypotheses about anthropogenic global warming from marginalized theories to the basis of international environmental policy, carbon markets, and emerging technological and administrative frontiers for local policy makers and entrepreneurs.

Similarly, climate change mitigation is also an administrative science of modeling and enumeration (Mackenzie 2009, Lippert 2012b). The day-to-day work that I observed of managing urban climate change was organized around the measurement of carbon emissions, cost savings, and climatic changes—phenomena which were brought together in a range of performative numbers, spreadsheets, charts, graphs, and other forms of visual representation; were written into strategy documents; and were
used as the basis of business cases which were written up to draw down funds from internal and external funding sources to finance carbon reduction activities.

In spite of the centrality of modeling and enumeration to the phenomena of climate change, these practices have remained of marginal concern to most anthropologists interested in the social and cultural implications of climate change. Edited collections on anthropology and climate change have tended to focus more on the “idea” of a changing climate, on weather lore, on local knowledge, and on the capacity of populations to adapt to climatic changes rather than on the participation of models, computers, and spreadsheets (Strauss and Orlove 2003, Crate and Nuttall 2009). As in the analysis of energy politics more generally, the material and the social have largely been treated as separate domains with an immediate causal relationship with one another. Where anthropologists have addressed the way in which the science and administration of energy and climate change has mobilized numerical or representational techniques for mediating between material dynamics and social phenomena, the role of the anthropologist has frequently been that of critic rather than of interested observer of a set of practices that have a situated logic and political purchase appropriate to the circumstances within which they are being mobilized (Lippert 2012a).

Laura Nader’s (1981) early work with energy engineers is a good example of an anthropological frustration with scientists’ use of numbers to “purify” and separate off material dynamics from social dynamics. Looking for a more social solution to energy problems, Nader finds herself exasperated with the way in which the models and measurements of energy engineers seem to be “getting in the way” of alternative stories about energy. Nader deals with this discomfort by characterizing energy scientists’ engagement with models and measurement as an almost “numerological” belief in the power of numbers to transform the world. Numbers, in Nader’s work, become cast both as a peculiarly cultural convention and a way of excluding more “human” concerns from the picture.

In contrast, the way I approach the practices of climate measurement and carbon footprinting is less to critique them as devices which distance us from an anthropological sensibility to social life “proper,” but rather to explore what kinds of “social” these measurements themselves are participating in producing. Rather than proposing that the anthropology of climate change is a matter of understanding human responses to directly perceptible environmental conditions, this article approaches climate
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change mitigation in the UK as a political phenomenon which brings together substance, sociality, and numerical representation in a transformative mix of human and nonhuman co-becoming. We might call the approach to understanding this transformative entanglement a “material semiotics” of climate change (Mol 2002, Law 2008, Verran 2012).

The Problem of Population
Olivia, one of the presenters at the “We Need to Talk about Growth” event, is a climate scientist. She is the second person on stage and runs through a presentation that illustrates the latest findings from the Climate Research Group at the University of Manchester, of which she is a part. Her slides provide a distillation of the kind of climate science that Edwards (2010) describes. Graphs of climbing carbon emissions since 1900 are juxtaposed with graphs of climbing temperatures projected in the coming 100 years. Maps depicting the distribution of projected temperature changes are shown, highlighting future hotspots over many of the major US and European cities. The central implication of Olivia’s presentation is that what appear to be unprecedented changes in both local weather and global climate are now recognized by a worldwide community of climate scientists to be the aggregate effect of the actions of the population of the world not just now, but stretching back into history. Olivia’s suggestions as to how to tackle this problem of population emerge from the display of more graphs that visualize the sum total of carbon that the world has left to burn before catastrophic climate change is likely to occur. In an attempt to speak to those who are already trying to find ways of reducing overall carbon emissions, Olivia outlines the concept of a “carbon budget,” explaining that the sum total of all future carbon emissions needs to be conceived of as an absolute quantity, that must be divided somehow equitably between current and future populations in different parts of the world.

While human activities have long been seen to be key to the formation of natural environments and even the cause of localized weather events (Grove 1995), the recognition that generalized human activity at a species level is proving capable of transforming the global weather system in potentially catastrophic ways has begun to be identified by some scholars and policy makers to be the basis of a new social and political problematic. In recent years, many social theorists have become interested in the way in which scientific analyses of climate change appear to have
brought about an unsettling of the boundaries between natural processes and cultural practices (Serres 1995; Chakrabarty 2009, 2012; Latour 2004b; Jasanoff 2010). A recognition of the co-implication of planetary environmental transformation and social practice has led some to argue that climate change is not a simple scaling up of local relationships between humans and their environments, but that the earth itself has entered a new geological age where human action is now the primary driver of planetary scale change. The geologist Paul J. Crutzen has termed this age “the Anthropocene.” In the Anthropocene, natural history can no longer be kept separate from human history, for humans as a collective force have taken on the guise of nature itself. As Chakrabarty puts it: “The wall of separation between natural and human histories that was erected in early modernity and reinforced in the 19th century as the human sciences and their disciplines consolidated themselves has some serious and long-running cracks in it” (2012:10).

If the human sciences are at the cusp of having to reconsider the foundational myth upon which analysis has proceeded over the last two centuries, so too, many scholars have begun to argue, is political philosophy (Serres 1995, Latour 2004b, Bennett 2010, Coole and Frost 2010, Marres 2012). With the scientific analysis of climate change apparently disrupting the separation between nature and culture upon which political philosophy has itself been historically based, some have argued that climate change scrutinizes—in new ways—the very basis of what constitutes a political actor (Marres 2011) or a political collective (Latour 2004a). While the people with whom I was conducting fieldwork did not tend to conceive of the implications of climate science as a philosophical problematic, they were preoccupied with the way in which climate science posited climate change as a particular kind of problem of politics. Here, the site of the political was the figure of “the population,” a notion that was undergoing a reframing by climate science, with significant implications for practical forms of intervention.

The problem of population has previously been considered as a feature of what some might call a “biopolitical” mode of governmental power. Anthropological studies of biopower have provided insightful analyses of the way in which the concept of “population” has been an important feature of modern practices of governmentality. Building largely on the work of Foucault (e.g., 2007), these studies have drawn attention to the way in which calculative, numerical, and ordering practices have been
part of the process by which modern social concepts like the individual, society, and the population have been formulated and operationalized (Poovey 1998, Ong and Collier 2005, Biehl and Moran-Thomas 2009, Heatherington 2012, Jain 2010). Statistical methods in particular have been shown to be a central part of contemporary modes of power and governance, with the abstraction, aggregation, and reconceptualization of “life” being a key part of the widely used concept of “biopolitics.” In the biopolitical mode of governance, statistical techniques have allowed problems affecting individuals to be scaled up to the level of the population or mass, providing a capacity for intervention into issues of “life” on a specific territorial scale. In medicine, for example, epidemiological studies identify the prevalence of a disease across demographic groups within a polity, allowing decisions about government health policy to be made on a whole-population basis. Similarly, problems of delinquency might be dealt with through an analysis of socio-economic background or educational attainment that is correlated with rates of youth offending to build up an aggregate view of the population of offenders which can then direct a course of action for intervention (Ruppert 2011). Population thus emerges as a discursive construct through which social processes can be both imagined and intervened in.

What is intriguing in the case of climate change science, however, is that while the language of population is still being used, the way in which the problem of population has become manifest appears somewhat different from the invocation of population in the operation of biopower. Unlike analyses of society which emerged out of the discursive operations of social statistics that themselves constituted “the population” as a meaningful site of governance, climate scientists appear to have produced the population inadvertently through their analysis of material processes. Through the modeling of material dynamics, climate science has, as we have seen, produced projections of our climate which have “called forth” (Stengers 2010) an analytical response which transcends forms of analysis that might have looked for explanations in terms of a “natural” process of environmental change (Edwards 2010). Aware of the hybrid nature of climate change, in place of a generic concept of nature, climate science has turned to that other twin of the nature/society divide, characterizing the cause of climate change through the generic category of population.

With the history of climate science being based not on an analysis of society, but rather on an ongoing engagement with socio-natural processes,
it seems no longer adequate to merely analyze the appearance of popula-
tion as a discursive operation. This is not a population constituted through
a political project of statistical aggregation, but rather an “empty” concep-
tualization of population that appears as the only available interpretation
of the causes of a particular material effect. Here, I suggest, government-
tal engagement with population operates less as a means of demarcating
a sphere of power/knowledge and more as a way of dealing with a new
space of not-knowing with implications for the framing of practices of
climate change governance.

Unpacking Population
With the models of climate science having identified climate change as a
generic problem of population, this particular framing of the problem has, I
suggest, been central to the kinds of administrative responses available for
tackling the problem in hand. Conceiving of the causes of climate change
as being located in something as generic as “society” or “population”
has constructed the problem in hand as one of an “empty” whole which
must be filled with the detail of its specific parts (Strathern 1991). Thus,
discussions of the population effects of climate change rapidly move to
questions of which part of the population is most responsible for climate
change (The rich? The West? Capitalists? Frequent flyers? Climate scien-
tists themselves?). The whole population of the world might be the cause
of anthropogenic climate change, but actually translating this observation
into operationalizable knowledge that is adequate to bringing about car-
bon reductions has provoked a complex process of disaggregation and
reclassification of the population into an array of constituent parts.

A key stage in the process of disaggregating this notion of population as
the cause of climate change has been to focus the management of carbon
emissions on specific geographical locations. In 2008, as part of its re-
sponse to the 1999 Kyoto Protocol, the UK committed, via the legally bind-
ing Climate Change Act, to an 80 percent reduction in UK carbon emissions
by 2050. Part of these emissions reductions were to be achieved through
carbon trading mechanisms, but at least one-third were to be achieved
via reductions in domestic carbon emissions through changes in fuel use
and energy efficiency. In order to achieve this reduction, in June 2008, the
UK government implemented “National Indicator 186,” a mechanism for
measuring the carbon emissions of local authorities which obliged local areas to take responsibility for their own contribution to carbon emissions.

At the same time as this indicator was being rolled out across the UK, a group of environmental activists in Manchester was also agitating for the city to make an explicit commitment to reduce its own carbon footprint. Many of those who supported the call for Manchester to reduce its carbon footprint stressed that what was key was to have a single percentage reduction in carbon emissions to which the city could be held. In 2009, the head of environmental strategy at the city council commissioned a group of scientists at the Tyndall Centre for Climate Research in Manchester to do some analysis to determine what level of carbon reduction Manchester needed to achieve to ensure that the city would fulfill a reasonable contribution to national climate reduction targets—i.e., an equitable contribution to the problem of the empty whole. The analysis produced two numbers. The first was based on the UK government’s “Low Carbon Transition Plan” and led to a figure of 30 percent by 2020. The second was derived from an analysis of required emissions reductions based on a report by the Committee on Climate Change. Analysis based on this latter report required Manchester to achieve reductions in carbon emissions of 41 percent by 2020. Concerned that the strategy would not just end up being a political sop, but a “real” investment in a sustainable future, the head of environmental strategy pushed for the latter figure to be accepted. In late 2009, a climate change strategy for the city, headlined by a commitment to the 41 percent reduction target, was passed by the Executive Committee at the City Council.

The figure of 41 percent was to become a local example of what Verran (2012) has called an “iconic number”—the basis upon which the city would be able to measure whether it had reduced its carbon emissions by a sufficient amount to be able to claim that it was “doing its bit” in tackling global climate change. However, like the generic “population” effect of global carbon emissions identified earlier, knowing whether the city was on target to achieve its 41 percent reduction goal would require further analysis and disaggregation before actions to bring about its reduction could be justified.

The analysis of the figures that were supposed to demonstrate city-level carbon emissions reductions were to prove more complicated than expected. On a wet autumn morning outside, I sat next to Liam, a council officer, who is rifling through a pile of papers that he has stacked on his
desk, looking for a document with a graph on it that he says will explain the problem. He pulls out a stapled wad of paper and flicks through the pages until he finds the graph which he places in front of me (Figure 1). “This,” Liam tells me pointing to a dotted line tilting down from the y axis, “is the estimated rate of carbon reductions since 1990. There wasn’t any city-level data then,” he says, “which is why the line is so smooth.” He runs his finger along the line and tells me, reading into the declination, that “this drop is the shift in the UK energy mix from coal to gas. It’s nothing to do with what we have done.” His finger stops on 2005. “This is where we start getting data on our own emissions,” he says. “And you can see we were doing OK.” We’re both looking at the graph and watch the line nudge downwards until it suddenly drops steeply between 2008 and 2009. “What happened there?” I ask. “I know, it looks great,” Liam says.

When we got those figures back we were like “yeah, we’ve done really well,” but then the next year the figures came back and they had gone up again and we realized it wasn’t us, it was just the recession. And that’s why I wanted to show you this. Because the graph looks like it is telling us how well we are doing but it doesn’t. It is a lie, and we know it is a lie.7

Each year, the Department for Energy and Climate Change (DECC) compiles figures on the aggregate energy use for sub-regional geographical areas in the UK which are then made available to local authorities. These figures provide the basis upon which cities like Manchester are able to begin to gauge the relative success or failure of their attempts to reduce carbon emissions and were the source for Liam’s graph. The figures that DECC provide are derived from data on “end user emissions,” and as verified official statistics, they promise to demonstrate the effects of carbon emissions.
reduction activities on a particular locale’s carbon emissions. However, as Liam’s narrative demonstrates, these numbers are in fact unable to provide the hoped for description of the link between the actions of city authorities and the individuals and companies they are working with to reduce their carbon emissions in the allocated time period. As a representational promise, they fail to provide the grounds upon which action at a local level can be justified and taken.8

One reason for this is the way in which the figures are compiled. DECC produces these figures by aggregating data held by energy companies on local energy use, and calculating a link between overall energy usage within the city and the kinds of fuel that are used to generate this energy. What these “top level” figures show is a pattern or a trend which demonstrates overall energy usage, and correlates it with the energy mix, but it is incapable of accurately describing either the causes of reductions in energy usage, or the effects of these specific changes on urban climate emissions.

One of the explanations that Liam gives for the pattern that he and I can see represented in the chart is a shift in the UK energy mix from coal to gas. Since the 1990s, the UK has gradually seen a change in its energy mix. The reasons for this are complex and require an understanding of the discovery of North Sea oil in the 1970s, industrial politics in Britain in the 1980s, and the associated dismantling of the coal industry by the Margaret Thatcher-led Conservative government (Helm 2003). From the perspective of officers in the city council, responsibility for the UK energy mix has been a process that has remained largely out of their control. In spite of some discussions about the possibility of promoting more decentralized energy infrastructures within the local area, decisions over the energy mix remain largely a matter for national and not local politics. Changing the mix from gas to renewables is seen as a national political and economic issue involving decisions about taxation regimes and the role of the six major privatized energy suppliers to invest or stimulate a market in renewable technologies.

If the shift from coal to gas is a move that is seen to be self-evidently well out of the city’s control, Liam also pointed out a second cause that could explain the city’s carbon reductions: the recession. The year which saw the sudden fall in the levels of carbon emissions in Liam’s graph was 2008 to 2009, thus coinciding with the crash in financial markets and slow down in industrial production in the UK. The spike which followed, Liam
explained to me, coincided with a marginal recovery in the regional economy. While local economic policies did attempt to navigate national economic conditions and turn them to local advantage, the recession, like the UK energy mix, was understood by Liam and his colleagues to be once again largely out of the council officers’ control.

Interventions through Energy Efficiency

Although the DECC figures were problematic as a means of demonstrating the effects of local carbon reduction initiatives on actual city level carbon reductions, this did not mean that they had had no effect on framing the problem in hand. Indeed, the DECC measurements of city level carbon emissions had been important in working out what kinds of activities local authority officers should or should not be engaging in to reduce carbon emissions. In spite of the difficulties outlined above regarding the establishment of a relationship between the causes and effects of reductions in carbon, the DECC figures nonetheless assisted in providing some parameters around what could be regarded as a reasonable local governmental response to climate change.

The DECC figures are based upon measurements of the carbon dioxide emitted from the burning of fossil fuels within the boundaries of any particular locality. The “National Indicator 186”—on which the city of Manchester was to be judged as to its success or failure in reducing carbon emissions—was determined by an analysis of the burning of fossil fuels in the city. This had the effect of framing the local response to the global problem of anthropogenic climate change as one of over expenditure of energy with the solution being a matter of finding ways of becoming more energy efficient. Reductions of fuel use, it was reasoned, would lead to reductions in carbon emissions as measured by the DECC statisticians. Even though it eventually transpired that local projects of improving energy efficiency were to be rendered invisible by measurement techniques that focused on the aggregation of overall energy usage within an area, an attention to reductions in fuel usage still provided a tangible and politically appropriate problematic around which to orient the project of reducing carbon emissions.

If the DECC figures provided the parameters within which the administrative response to climate change was to be framed, the local analysis conducted by Tyndall Centre scientists provided a further intervention
into the question of how to identify pragmatic areas of intervention within the broad field of energy efficiency. The report, which was commissioned to identify the carbon reduction targets that Manchester both could and should make, provided a breakdown of the general 41 percent target into a series of specific areas of action. The aim of the report was to determine where energy efficiency savings would be pragmatically and financially achievable. The analysis used a cost-benefit model called MARKAL to align possible levels of carbon reductions with real costs of implementation and the financial savings that might be achieved through reductions in fuel use. The purpose of this analysis was to move from an understanding of the broad area of intervention within which they were to be measured—reductions in fuel use through energy efficiency—to the specific projects that would provide them with the greatest returns. Initially, the areas of intervention produced by the analysis were: “services,” “electricity,” “residential,” “industry,” “transport,” and “upstream/non-sector.” On seeing this breakdown, council officers asked the climate scientists if they could reconfigure them into areas which they felt that they could act upon, namely: Buildings, Energy, and Transport.

With the re-classification of the energy reduction targets into these three categories, buildings immediately appeared as holding the biggest potential “wins” in CO2 reduction terms for Manchester. First, buildings were considered to be responsible for the biggest “chunk” of the projected carbon reductions savings under the current form of measurement.11 As well as offering a site where tangible carbon reductions could be realistically imagined, buildings were also “accessible” as spaces of action for the group of people that had been assembled to tackle Manchester’s climate reduction targets. In an interview with the energy manager of one of the largest commercial building-occupiers in the city, he explained that with buildings “you only need to get about ten people around a table in Manchester and you have 50 percent of the buildings in the city covered.” The “ten people” that he was alluding to included the estates managers of: the four universities in the city, the City Council, the National Health Service, a few of the largest social housing providers, and two or three commercial landlords in the city.

In turning the general problem of energy efficiency into a specific problem of operational areas of intervention, the work of measurement in the pursuit of climate change mitigation can be seen to have been more than simply a straightforward response to representations of climate change as a material process. Rather, as part of an ongoing socio-material process
which tacked back and forth between measurements, descriptions of those measurements, and a particular political landscape, different numbers were being mobilized to do different transformative work. If the DECC numbers were a means of demarcating energy efficiency as a general parameter of intervention that might be able to respond to the population-effect induced by the climate scientists’ figures, the calculations that went into deciding the distribution of activities within different areas of intervention were operationalized as a means of redistributing carbon reductions according to a measure of their differential value. This was to become a particularly important issue when it came to arguing the rationale for funding particular projects of intervention to reduce carbon emissions within particular buildings. Indeed, it was in the process of attempting to argue the value of carbon reduction projects that the population-induced problem of climate change was to find itself confronted with a more conventional biopolitics of local government intervention into questions over living standards.

**Energopower and Biopower**

In the previous section, I described a tension between analytical processes that aimed to respond to the politics of population as the explanation for climate change, and situated practices of implementing projects of carbon reduction that had to take into account more conventional biopolitical understandings of good living. This tension was particularly clearly demonstrated when I went to meet Andrew who runs the capital works division of a large public sector organization in the city. From the outset, Andrew was candid about the difficulty that he had faced in “retrofitting” the organization’s buildings. Andrew had been very involved in installing energy saving measures into his organization’s building stock, and was acutely aware of the tensions that lie between the requirement to respond to the demands of climate change, and the demands of employees. As I finish explaining my research to him, he says to me, leave your notebook there—I want to show you something. He walks me through the office. At the end of the office, we come to a large meeting room and he opens the door and ushers me in. “Sit down at the table,” he says. I do. He turns on the lights. “I want you to tell me what you think.” The tone of the light is cool and white, and there is a strange play of shadows on the walls. “What do you think?” “The light is a bit odd,” I respond. “That’s what I mean,” he says. “We put in these new lights, but now people in my office are saying they cannot work and
that the lights are giving them headaches. Have you ever been into a Code 6 house?”12 he asks me. “I haven’t,” he says, “but people who I speak to who I trust say it’s absolutely diabolical—it’s completely airtight! This is the problem,” he tells me. “It is about moving from it being a technical solution—with graphs and all that where you say that is really good—and realizing that the cultural stuff is actually what’s really important.”

Light bulbs were just one in a whole armory of more or less socially controversial technologies of transformation. Saving energy on computers was to be achieved by asking people to hot-desk rather than have their own desks. Personal heaters and fans were to be removed from offices when people relocated to the “retrofitted” town hall. In the name of energy efficiency, people were also being asked to change the way in which they traveled to work, to rethink the way in which they dressed for work, to consider what they did with their rubbish when at work, to be aware of the environmental effects of leaving lights and computers on overnight, and to become increasingly attuned to their use of resources like paper. Anyone involved in implementing these programs of bringing about energy efficiency recognized that these were as much social as technical processes (Guy and Shove 2000), and often struggled with the question of how to encourage people to change their behaviors in the name of a politics of climate change as a population induced problematic.

In the process of translating figures and projections into the implementation of both technical and social solutions, it was strikingly evident that the carbon reduction figures were not enough to justify any of the interventions on their own. In order to make the benefits of carbon reduction appear as imperatives for action, these carbon figures had to be “insulated” with a whole raft of alternative arguments as to why energy efficiency might be socially important. The most common of these arguments was financial. Both in institutional settings (like the city council) and in domestic settings, the primary argument that has been made for putting in place energy efficiency measures is the cost savings that they will produce. In this respect, retrofitting has often been articulated as a “win-win” solution, benefitting both personal or organizational finances at the same time as it benefits “the environment.”

However, the financial argument was itself often understood to be lacking by those who were working to actually try and encourage people to put energy saving technologies into their homes or businesses. Either the financial savings were seen to be too slight to warrant investment in
whatever technology was deemed necessary to reduce emissions, or people were recognized to be driven by factors other than personal economic gain. Indeed, the most successful programs of implementing energy saving technologies appeared to be achieved in cases where a financial argument could be supplemented with additional reasons why the technologies of energy efficiency might be particularly desirable.

In Manchester, one such example has been the implementation of loft and cavity wall insulation by certain housing associations. Housing associations are not-for-profit organizations that manage the city’s social housing. As most of the people living in housing association houses have very low incomes, these houses have been eligible for a number of grants over the years to improve the energy efficiency of the homes, not just as a way of mitigating climate change but also as a way of reducing a recognized problem of fuel poverty. For the purposes of this article, the entanglement of arguments for climate change mitigation with the imperative to tackle fuel poverty are particularly interesting. Derived, as we have seen, from a population effect that appears as an outcome of climate scientists’ projections, it has remained difficult for people working in local authorities or public sector organizations to publicly justify decisions to act on the basis of a projected future effect for which everyone is deemed somewhat responsible, and to which everyone will ultimately be subject. In contrast, fuel poverty has offered a tangible problem, existing in the here and now and affecting a potentially identifiable sector of the population for whom local governments can legitimately be expected to take some responsibility.13

Bolstering the argument about the need to act in the name of climatic changes with other financial arguments has led to some progress being made in the ambition to reduce energy use. Aligning the argument about the population effects of climate change with concerns about fuel poverty has gone a little further. Other arguments that have been mobilized to support projects to implement carbon reduction are now also coming to include an attention to the health benefits of insulation. Properly insulated homes are also now argued to be healthy homes, and eradicating dampness is understood to also eradicate asthma and other respiratory diseases.

To turn the global case for carbon reductions into a local political case then, we find that the “empty” concept of population, produced as a by-product of the analysis of material processes (global temperature
fluctuations and levels of atmospheric carbon dioxide), appears to have a limited capacity to operate as a motivator of political action. Unlike the biopolitical concept of population, which has functioned as a means of politicizing individual need by scaling it up to the level of a social group, the population effect of climate science has proved limited in its capacity to provide an impetus for political action. Instead, its power has been to participate in the demarcation of spheres of action within which more familiar arguments regarding the need for states to intervene in the management of the body-politic can then be mobilized. It might be argued that these more conventional governmental arguments for why the state should intervene in people’s lives—health, fuel poverty, and financial savings—bring us right back into the biopolitical understanding of population which climate change appeared to challenge.

Conclusion
This article has considered the cultural politics of climate change by approaching climate change as a socio-material process and a form of social analysis. Building on work that has begun to suggest that anthropogenic climate change has the capacity to unsettle the boundaries between the natural and social sciences, this article has attempted to approach climate change as neither a natural process, nor a product of the cultural imagination, but rather to consider it as a hybrid problematic whose very hybridity has implications for the kinds of politics it is participating in producing. On the basis of fieldwork conducted with people who have been trying to understand and tackle global climate change by encouraging a reduction in local emissions of carbon dioxide, I have explored what kinds of political actors climate change has come to produce, and have traced the implications of these political categories for the demarcation of spheres and methods of intervention. Focusing in particular on the figure of the global “population,” I have aimed to illustrate how this concept has emerged out of an analytical attention to the problem of global climate change as a hybrid socio-natural phenomenon, and has subsequently been mobilized in the identification of novel sites of governmental action (energy saving technology, buildings, transport). While these sites have been framed as new locations for what we might call an emerging energopolitics, precisely how these objects and sites might be encouraged to participate in a politics of climate change has proved challenging, and location-specific. In
order to activate these objects within the rubric of a more familiar politics, I have demonstrated how more conventional “biopolitical” arguments for the relationship between individuals, infrastructures, markets, and states have ended up being invoked in Manchester. In telling this story, my aim has not been to make a generalizing claim as to either the energopolitical or biopolitical effects of climate change. Rather, my intention has been to acknowledge the material dynamics of this contemporary social problem-atic and their implications for reconsidering the parameters within which a comparative analysis of energy politics might be pursued.

Similarly, if the anthropology of energy is to do more than provide a conventional cultural analysis of an emerging field of material relationships, what the analysis provided here suggests is the importance of considering the specific ways in which the unstable and multiple materialities of energy come to participate in the formation of contemporary social and political relations. As my analysis of climate change politics has illustrated, the relationship between energy and society is enacted through techniques that deal with material processes in diverse ways, including technical standards, media representations, economic calculations, and technological relations. While the range of the phenomena that energy politics appears to bring together—natural, social, economic, cultural, material—might thus seem daunting to an ethnographic sensibility more used to unpacking the dynamics of culturally demarcated sets of social relations, I suggest that the very hybridity of energy, and the reinvigorated holism that it evokes, provides a particularly fruitful opportunity for anthropology. As a discipline which has always tended towards analytical holism and the questioning of the conventions of institutional boundaries, the discipline of anthropology, more than perhaps any other, should be well-placed to consider the analytical and political ramifications of the emerging energopolitical configurations that this special collection has set out to address.

Endnotes:

1For a longer discussion of a move within anthropology from an interest in ideas or beliefs to analytics, see Kirsch (2006).

2As Strathern (1992) pointed out in her introduction to After Nature, moments of change, rupture, or, in current parlance, “crisis” are privileged moments for observing the de-naturalization of previously settled relations. Climate change not only provides the grounds for intervention into an already known reality, but also participates in the creation of new objects and subjects of governmental intervention, not least
the contemporary problem of “global climate change” itself. One of the most lively and most commented upon areas of intervention and reflection to be provoked by climate change thus conceived is, as this special collection attests to, the issue of carbon-based energy.

3The apparent failure of climate science to have actually made significant inroads into reducing carbon emissions has led many to claim that climate change is an issue that can be characterized by its tendency to remain separated off from politics. Latour (2011) has argued that climate change appears to be peculiarly devoid of the kind of public politics that might be necessary for bringing about a transition to a low carbon energy future. Meanwhile, commentators like Swyngedouw (2010) have gone so far as to identify climate change as an instance of a “post-political” moment, where ideological politics has been replaced by a stifling consensus around the need for a greening of society. When even companies like BP and Shell promote themselves on their green credentials, it is tempting to concur that climate change is characterized not by its political ramifications but by its capacity to stand outside politics, proving itself time and again to be incapable of the radical transformation of social and political life that many hope for (Sawyer 2010).

4There are parallels here with Swyngedouw’s (2010) description of the self-evident, consensual nature of the politics of climate change. However, while Swyngedouw is interested in the way in which the normative hold of an appeal to something like “population” as the primary cause of anthropogenic climate change is basically post-political, this article aims to tease out the micro-politics of attempts at engagement with this concept in the practical activity of transforming climate science into an administrative practice of transformation.

5In a recent article, Brian Massumi (2009) has argued that we are witnessing a shift in the techniques and concepts through which contemporary power is enacted, arguing that this shift constitutes a move from what Foucault called “biopower” to what he terms “preemptive power.” It is in a similar vein that I have suggested that climate change appears to be unsettling conventional biopolitical modes of action, though my interest is less in the politics of preemptive action, as the incorporation of material dynamics into social analysis. Massumi suggests that “Biopower’s ‘field of application,’ according to Foucault, is a territory, grasped from the angle of its actually providing livable conditions for an existing biological being” (2009:167). Climate change, however, raises the specter that the practices of providing livable conditions in the here and now—which have been tied in large part to the use of fossil fuels—are the very source of the predicted un-livability of the planet in some as-yet-undetermined future. As we will see, the specter of this future is raising complicated questions as to how we should act in the here and now, and who has the responsibility for determining the course of action.

6While 41 percent on a 2005 baseline was the 2020 reduction target for Manchester, 48 percent on a 1990 baseline was the target for Greater Manchester. It was explained to me that these were the same level of reduction. While 41 percent was the number that was most often cited, the graph shown denotes the 48 percent reduction figure.

7In a subsequent conversation, Liam was keen to stress that by using the term “lie” he merely wanted to demonstrate that the figures were misleading. He emphasised that he did not think anyone had actually intended to make the figures misleading, and was concerned that his words were not misread as an accusation that someone, somewhere had actually lied.

8In Verran’s (2012) terms, these numbers are “indexical”—they order things in a particular kind of array; however, in order for them to be mobilized as numbers that can participate successfully in a local politics, they need to become “valuative”—the basis upon which judgments regarding action can be performed (also see Muniesa 2011 on the performativity of numbers).

9Energy efficiency measures have also been put forward on an international stage as a relatively uncontentious means of engaging the energy-based causes of climate change. Unlike a shift to a new energy mix which requires the realignment of state, corporate, and international interests, energy saving measures are often posited as a way of making relatively simple changes to an already existing infrastructure. Moreover, in the face of the direction of changes to energy supply such as the exploration of shale gas—which some argue will extend rather than reduce dependence on fossil fuels—energy efficiency is often cited as a politically palatable way of continuing to be seen as tackling climate change. In response to the most recent report of the international energy agency—which announced that shale gas exploration in the US promised to secure America’s energy for the foreseeable future—the head of the agency Fatih Birol is reported to have said that while extraction of these new fossil fuels “makes a huge difference” to the global capacity for reductions in carbon emissions, “there was still hope of avoiding disastrous levels of climate change if companies pursued energy efficiency, which could yield immediate benefits in cutting energy bills.”
Since energy efficiency was established as the focus of local carbon reduction measures in Manchester, other alternative suggestions have been put forward. These have included a call for a greater attention to supply chains, particularly in the manufacturing, transport, and consumption of food and building materials.

Recently, there has been an exploration of a new measurement of carbon emissions—from a production to a consumption based measure of carbon. One effect of this has been to open up new areas of activity: specifically, food, supply chains, and waste.

Code Level 6 is part of a UK national standard, the code for sustainable homes, developed by the Department for Communities and Local Government. Code 6 indicates the highest level of energy efficiency for new houses.

On the anticipatory logic of contemporary governance, see Ben Anderson (2010) and also Brian Massumi (2010).

References:


Footprints in the City: Models, Materiality, and the Cultural Politics of Climate Change


**Foreign Language Translations:**

Footprints in the City: Models, Materiality, and the Cultural Politics of Climate Change

**Keywords:** Energy, climate change, population, biopolitics, governance, numbers, models

Pegadas na Cidade: Modelos, Materialidade e a Política Cultural das Alterações Climáticas

**Palavras-chave:** Energia, alterações climáticas, população, biopolítica, governança, números, modelos

城市中的生态足迹：气候变化的模式, 物质性, 与文化政策

关键词：能源, 气候变化, 人口, 生物政治, 管理, 数字, 模式

Следы ботинок в городе: Модели, материальности, и культурная политика изменения климата

[Ключевые слова:] энергия, энергетика, изменение климата, население, биополитика, правление, цифры, модели

تأثر الأقدام في المدينة: نماذج، النسبية، والسياسات الثقافية للتغير المناخي

كلمات البحث: الطاقة، التغير المناخي، السكان، سياسات الطاقة الحيوية، الهوكمة، الأعداد، النماذج