



Understanding the Politics of Low Carbon Transition: Context, Paradigms and Power

Dr Caroline Kuzemko

EPG Working Paper: 1301

Abstract:

Given the scale of challenge that climate change presents to society and the urgency implied by limited time frames a growing body of academic work is attempting to conceptualise complex socio-technical transitions, such as in energy systems, and how they take place. Much can be learnt from this literature about processes of transition, not least that they are underpinned by multiple interconnections that take place in a range of different areas. This literature also suggests that although radical changes in complex energy systems have historically taken place this low carbon transition is different – not least in that it is in part politically instigated. As part of governing successfully for transition, therefore, much of this literature concludes that political institutions need to become more directly involved in supporting the niche technology markets that have historically been fundamental to innovation and change. The socio-technical transitions literature has, however, tended not to explore or conceptualise the politics of transition in any great depth. Politics is often taken to be neutral or is reified and policies are assessed and recommended without analysis of whether these will work in specific contexts. Using new institutionalist concepts, such as policy paradigm theory and depoliticisation, this paper is one contribution towards filling this gap. It will explain why certain political institutions persist within given contexts – even in the face of climate change objectives - whilst also conceptualising possibilities for the type of political change envisaged by so many in this area of research.

Keywords: energy; transition; climate change; institutions; politics

Contact: Dr Caroline Kuzemko, C.Kuzemko@exeter.ac.uk

Date: January 2013

Introduction

Over the past twenty years a wealth of academic literature has emerged that explores low carbon transition characterised as a long-term process that includes a wide variety of different analytical areas – such as technology, the economy, industry, politics, ecology, culture and belief systems (cf. Rotmans et al 2001: 17). Low carbon transition is a normative project that takes place on a grand scale given the number of areas involved, the scale of changes needed and restricted time frames given the set limit of two degrees warming. Largely, the sociotechnical literature, and the ‘transitions management’ literature in particular, concludes that governance is central to transition and to supporting niche markets: but certain types of governance are recommended over others. One of the main critiques of this literature is that, despite the centrality of governance to transition, the politics of transition are often left unproblematised and questions about *why* certain governance practices prevail within certain contexts are not addressed (Meadowcroft 2005).

This paper seeks to both provide political context within which to better understand low carbon transition but to also conceptualise change within one analytical area – energy policymaking. The intention is to contribute to socio-technical debates by problematising low carbon governance and by providing a specific, nuanced analysis of the politics of transition and of governance change. Insights from socio-technical and historical economics transitions literatures will be combined with insights about change and continuity from historical and ideational institutionalisms. These perspectives are rooted within some quite distinct theoretical paradigms, but conceptual eclecticism has here been consciously designed so as to include complementary insights from these theories. This has also been done because it is the author’s contention that effective governance for low carbon transition should be pursued within a spirit of deliberation, reflection, flexibility and conscious consideration of a range of alternative approaches to governing not just energy, but also whole socio-economic systems.

The paper starts with a review of how change is conceptualised within socio-technical and historical economics transition literatures with an emphasis on the role of niche innovations within this process. Three important aspects of change are highlighted as being central to how low carbon transition is conceptualised. Transitions are understood as dynamic, complex and as interconnected across levels and areas; as processes that take place over periods of time through different stages; and as having different drivers and enablers. Low carbon transition is, however, understood as being unprecedented and as different from previous large-scale energy transitions.

The following section explores the IPE literature on institutions and change, in particular research that understands governance choices as socially constructed but also reveals how these choices relate to political actions and structures. This research allows us to conceptualise energy and climate governance in terms of difference and variety and in terms of political contexts. Application of these concepts goes some way towards filling gaps identified above in socio-technical conceptualisations of how governance relates to low carbon transition. This section observes, in applying Vivien Schmidt's models of capitalism approach, that there is a relationship between different energy governance institutions and wider economic governance structures. This helps to explain why in some 'market' economies less progress has been made in encouraging new, innovative solutions whilst in other 'managed' economies more progress has been made. This section also suggests that beneath conceptualisations of political contexts as 'market' or 'co-ordinated' there are other contexts specific to sectors, such as energy, that are highly pertinent to how the politics of low carbon transition are constituted.

The last section of the paper will combine concepts from sociological institutionalism, as well as some from socio-technical transitions literatures, to conceptualise how and why governance change takes place. This takes us back to the normative orientation of the paper given claims that a great many countries, including the UK, need to make significant political changes in order to be able to enact a managed transition but asks specific questions about prospects for such change. Ideational institutionalists suggest that significant political change, understood as punctuated equilibrium, can take place at moments of crisis – seen as a moment of contestation, policy delegitimation and also of decisive intervention. Such moments allow for a greater degree of political and popular deliberation of political issues, or even for some issues to be placed on the political agenda, allowing for a wider range of alternative narratives to more openly contest the current paradigm. Just such a contestation of governance for energy transition is arguably taking place in the UK and the paper will conclude with reference to this crisis debate - thereby explaining some specific resistances to change and explaining why certain changes are taking place.

1. Socio-technical Transitions Literatures

There are a number of insights about low carbon transition and how it is unfolding that can be gleaned from the literatures on socio-technical transitions, and these are presented here below. What should be noted at this point, however, is that transition has powerful normative attractions for those concerned with sustainability. Some academics seek not just to understand systemic change for its own sake but in order to enable certain types of futures:

(l)ow-carbon transitions... are 'purposive transitions', which are deliberately intended and pursued from the outset to reflect an explicit set of societal expectations or interests." (Smith et al 2005: 1502)

Answers to questions about whether climate change is anthropogenic or not, or about whether we should be acting to secure a more sustainable future for our planet have for most transitions scholars already been reached – yes being the answer in both cases. Furthermore, for many transitions scholars answers to these questions were supplied long ago but academics and other stakeholders have, since then, had to watch in growing dismay whilst progress on climate mitigation has been painstaking and slow.

An earlier special issue of *New Political Economy* included a number of papers introducing key debates to readers, one of which was about environmental political economy (Meadowcroft 2005). The paper introduced a number of strands of research that sought to understand responses to environmental change but with a strong focus on the ‘transition management’ literature that focuses on understanding and orienting change in large socio-technical systems (ibid: 483). Here insights will also be gleaned from this literature but also from other research strands such as the closely related multi-level perspective (MLP), co-evolutionary theory and from historical economics.¹ Generally speaking the socio-technical transitions literature is marked by an intellectual ancestry rooted in “studies of science, technology and innovation” (Shove and Walker 2010: 471), and in environmental and evolutionary economics (Markand et al 2012: 957; Smith et al 2010: 436). To these intellectual roots over the years have been added insights from sociology and from economic historians that sought to look back at previous systemic transitions in order to draw conclusions and provide some understandings for today’s low carbon energy transition.

1.1 What is a Socio-technical Transition?

Within this broad literature one central concept for understanding transition relates to that which is to change or in this instance the sociotechnical system, or regime. These are understood as being made up of a wide range of different areas across industry, technology, politics, and society (Turnheim and Geels 2012). Each socio-technical system will have its own complex specificities, infrastructures and institutions that inter-connect dynamically across areas (Markand et al 2012: 956). These systems are understood to be influenced in part by material factors and capacities but also by behavioural routines and organisational structures that can create technological co-evolution but also create lock-ins that can be difficult to alter (van den Bergh et al 2007). To further complicate matters socio-technical systems are likely to then inter-relate with and provide context for other socio-technical systems. For example fossil fuel and

¹ Foremost works include: Fouquet 2007 and 2010; Foxon et al 2005; Geels various; Geels and Schot 2007; Kern 2011; Kern and Howlett 2009; Meadowcroft 2011; Perez 2002; Rotmans et al 1998; Shove and Walker 2010; Smith et al 2005 and 2010.

transport systems have been intrinsically inter-linked historically and practices in each area have tended to both influence and support certain, carbon intensive, practices in the other. As such they can be understood as having co-evolved but also when put together as making up one broader area in which powerful path-dependencies have arisen that have so far impaired low carbon transition.

According to the multi-layer perspective (MLP) socio-technical systems, or 'regimes', also interact across and between other levels, the 'sociotechnical landscape' and 'niche-innovations' – these levels are understood as heuristic, analytical concepts (Geels and Schot 2007: 399). The sociotechnical system, or regime, sits between landscape and niche levels and plays a structuring role in that it provides the 'selection environment' for new technologies and other innovations that take place at the niche level. Regimes constitute the mainstream, and highly institutionalised, way of realising various social functions (Smith et al 2010: 440). They are made up of shared cognitive routines that inform specific rule sets, cultures and skills that become embedded within institutions, governments and/or corporate, over time. These rule sets can stabilise existing trajectories but also blind actors to new developments outside their focus (ibid 2007: 400).

The sociotechnical landscape, or macro, level represents the 'external structural context' for the regime level and is made up of social and physical factors such as wars, broad political coalitions, cultural norms, paradigms, and economic growth (Geels and Schot 2007: 400; Smith et al 2010: 440). Despite its rather unproblematised role as 'structuring context' the landscape level can also be influenced by regimes. One example given is the "...catalytic effect aeromobility and communications regimes" have had in terms of enabling socio-economic globalisation (Smith et al 2010: 440). Last, but by no means least, the niche, or micro, level is significant in that this is where radical novelties, with an emphasis on technical innovation, which can pioneer new ways of constituting and satisfying social demands are understood to emerge (Kemp et al 1998; Geels and Schot 2007). These novelties are "... initially unstable... configurations" and as such niches need to act as 'incubation rooms' protecting these novelties against mainstream market selection (Kemp et al 1998; Schot 1998).

Despite some of the path dependent characteristics inferred in conceptualisations of a sociotechnical regimes they can and do change. Socio-technical transitions take place over extended periods of time, usually over more than one generation, and represent change from one relatively stable system-state to another (Geels; Kemp; Rotmans et al 2001). Transition is also sometimes understood, with reference to Kuhn's scientific revolutions, as large-scale transformation within society or important sub-systems during which the structure of the societal system fundamentally changes (Verborg and Loorbach 2012: 6). Sociotechnical transitions are

made up of sets of interconnected changes that reinforce each other but, as with conceptualisations of regimes, also take place across and between several different areas and levels (Rotmans et al 2001: 2). Low carbon transition in specific is understood as involving changes to

...practices of energy use; innovation and deployment of a range of low carbon technologies; and a broader change in the mix of industries within national and global economies (Foxon 2011: 2258)

These kinds of changes infer not only new methods and practices but also that different social groups, for example new producers, distributors and retailers, will benefit from the process of transition while others may lose out (Fouquet 2010: 6591). This is partly why some incumbent groups can so often pitch their, often not inconsiderable, assets at resisting change, or at least at influencing what kind of change takes place (ibid 2010: 6592).²

Returning to the MLP outlined above transitions are conceptualised as largely top down in nature. Niches are understood, sometimes with reference to Thomas Kuhn, as exogenous sites of 'revolutionary change' as opposed to regimes that tend to reproduce normal innovation patterns (Smith 2010: 440). However it is only changes in the landscape level that can destabilise regimes thereby creating opportunities for niches to break through (Geels and Schot 2007: 400; Kern 2011: 301; Smith et al 2005: 1496). A specific example of this might be that scientific knowledge about climate change, considered as exogenous to the fossil fuel regime, has put pressure on current regimes of energy production and consumption to change. This has in some countries allowed for new niches to break through, for example energy produced from renewable sources, and form part of an emerging but alternative regime of energy production and usage. As such niches are understood to have historically played a central role in energy transitions (cf. Fouquet 2010; Schot and Geels 2007 and 2008), but clearly the niche innovations would need to be developed to a certain extent before being able to challenge the dominance of an incumbent regime.

1.2 Low Carbon Transition is Different

There are two important aspects of how sociotechnical transitions are conceptualised that need to be highlighted here – aspects that mark low carbon transition out from previous transitions and that are most relevant for public policy today.

² This is mainly a references to corporates, both individually and as organised groups. Clearly differentiation should be made between companies that resist change and those that are currently working actively to enable low carbon transition (Penna and Geels 2012: 1000).

1.2.1 *Temporality of Change*

The first has to do with the temporality of complex transitions. It has already been mentioned that transitions are understood to represent a multiple of processes that take place over extended periods of time. There are, also, different stages within transition processes – for example the ‘innovation chain’ moves from initial innovation at the niche level, through development, learning curves, and declining costs and then on to the implementation and diffusion phase (cf. Fouquet 2010). Rotmans et al have put forward a model of change that relates the innovations to what is happening at the regime level. Transition takes place in phases: ‘predevelopment’, ‘take-off’ where the state of the system starts to shift, ‘breakthrough’ is when structural changes take place, and the ‘stabilization phase’ (2001: 17).³ Seeing transitions as phased helps to explain how change takes place across related but distinct phases, and how stages are important to one another but thus far these models are somewhat linear and unproblematised, a point to which we will return later.

The work of Carlota Perez on technological revolutions also emphasises phases, in her case development, finance and installation; transition including crisis; and mass roll out (Perez 2002). These phases are not dissimilar to those suggested by other scholars but her work emphasises the different roles played historically by markets (often in the form of finance related institutions) and by the state during different phases. This work suggests that during the first development phase markets play a dominant role providing finance for new innovations and ideas. During the second phase the bubble bursts, assets had become over-valued and it becomes clear that only narrow portions of society had benefited from these innovations. Interestingly, from her perspective, the state has tended to play a much greater role in the third phase to underpin mass deployment of new technologies such that benefits are distributed more widely in society (ibid 2002). One example of this might be the central role that many states took in establishing electricity networks so that whole populations could benefit from access to affordable electricity and associated modernisations. As will be more clearly illustrated below, given the degree to which low carbon transition differs from previous sociotechnical transitions the emphasis within the literature now is on state support for niches in the first, development, phase.⁴

This point about phased regime transition relates then to the second important point about historical transitions – that they almost without exception took place over considerable periods of time (Fouquet 2007 and 2010; Grubb et al 2008; Jefferson 2008). In his historical analysis of major transitions in UK energy services over the past 200 years, Roger Fouquet notes that it

³ As will be discussed in more detail below, this quite linear model of change has similarities with economic historians, Oliver and Pemberton’s, model of policy paradigm change.

⁴ This kind of role for the state in early rather than late development is not unprecedented – see US state support for early hydraulic fracturing and for ICT (via military institutions) research and development.

took an average of over 100 years for new technologies and services to travel along the innovation chain and then a further 50 years to diffuse (Fouquet 2010: 6592). To look at one energy 'revolution', that from wood to coal, there were path dependencies slowing transition down:

... lock-in effects: lack of new knowledge and skills amongst sub-groups, slow 'innovation chains' amongst households meant that it took roughly 150 years for the switch from wood fuel to coal to take place in heating (ibid 2010: 6588).

Clearly, transitions occurred at different rates. It took centuries for the transition from traditional animate energy to fossil fuel sources to evolve, involving numerous services and sectors at different times between 1500 and 1920 (ibid: 6590). Despite noting that innovation chains appear to be becoming slightly shorter over time, this research concludes that early action is warranted to steer transition to a low carbon economy (ibid 2010: 6596). This is most particularly warranted now given the combination of these historical long lead times with time limits on global warming.

1.2.2 Drivers of Transition

So far some explanations have been put forward for how transitions take place – albeit in somewhat linear and top down ways. This section provides a less linear explanation of transitions that also provide some finer granularity of how change takes place. If we come back to the example of top down change given above then one example of a driver for change was new (scientific) *knowledge* about anthropogenic climate change. This knowledge was understood as both a force for change as well as being an exogenous threat to an existing regime – what Smith et al might refer to as a 'selection pressure' (2005: 1498). What then also become important in understanding transition, as large-scale change, are the adaptive capacities of the existing regime to respond to those pressures. For example, if a regime can respond to selection pressures using resources already available, or which can be easily co-opted, then transition can be avoided and change of a more incremental nature is likely. However, without available adaptive resources and in instances of actor and technological rigidity the likelihood of major structural change increases (ibid: 1499). This helps us to understand transition as related to the type of regime in existence and its capabilities of responding to new socio-economic pressures.

If we consider that currently new scientific knowledge is part of the landscape level, that is made up of amongst other things of paradigms, then this suggests a different scenario in that previous transitions seem to emphasise new knowledge as emerging at the niche level. Again, this is where we return to the notion that low carbon transition can be marked out from previous

transitions. It is worth returning again, here, to Fouquet's histories of sociotechnical transitions and asking more specific question about historical drivers of structural change (2008 and 2010). Of course, Fouquet's work is an economic history of transition that does not ask many questions about the politics of these changes, but he does note that principal drivers for structural change in energy sectors were to do with prices, costs and better services. This is a more bottom up notion of change. Specifically he notes that "... in all cases cheaper or better services were key to the switch" – better being defined as services that were easier, cleaner, safer or more flexible to use (ibid: 6591).

This infers that consumers of new energy services, industrial and individuals, experienced major, clearly tangible changes and corporates had strong economic incentives, given the prospect of lower costs and or of greater sales, to invest in new innovations. For individuals, instead of having to fill dangerous lamps with gas, people were able to flick a switch on a wall for light – these are innovations that imply a clearly discernable benefit and high value. Although it was frequent that the high price of new innovations made them accessible initially to a limited range of people, consumers were willing to pay extra given the tangible differences experienced. This support during the phase of higher prices, before economies of scale allowed for prices to fall, enabled new innovations to become refined gradually until they could compete with the incumbent energy source (ibid: 6586).

Low carbon transition appears to have rather different drivers given that consumers this time around appear to value, for example, renewable sources of energy rather differently than previous energy innovations. This might not be surprising given that how people experience these innovations is completely different. Consumers, who may or may not believe in anthropogenic climate change are being asked to pay more for services that they will experience in exactly the same way as before. A light switch turned on will still provide light, a mobile phone plugged into a socket will still be recharged – the benefits that accrue are longer term and are not immediately visible or touchable – as such only a few will be willing and able to pay more to enable wider social benefits. Fouquet concludes that without legislation, it can be expected that most consumers will not pay more for the environmental improvements, as the benefits are social rather than private (ibid: 6593; cf. Turnheim and Geels 2012: 36).⁵ One final aspect of low carbon transition that makes it novel is that previous energy transitions have resulted in more, rather than less energy being produced and consumed (Fouquet 2008). As such there is no precedent for low carbon transition given the different value being placed on

⁵ Another way of expressing this relates to notions of extrinsic and intrinsic value. Intrinsic value includes how a commodity or service is produced which in the case of renewable electricity would include social values not so easily discernible to customers who focus on extrinsic value (cf. Marx 1890).

specific energy innovations, given requirements to consume less, not more, energy and the considerable urgency this time around.

1.2.3 Low Carbon Transition as Explicitly Political

This is where we return to some quite normative assumptions about the role of politics and governance in low carbon transition. Politics is the ‘constant companion’ of sociotechnical transitions in that it can be understood as part of the landscape, regime and niche levels – it serves as context, enabler, obstacle, arbiter, distributor of benefits and manager of repercussions (Meadowcroft 2011: 71). But the politics of low carbon transition are even more charged given that sustainable development is a normative project built around particular visions of what the sociotechnical future should look like. Low carbon transitions pursue wide ranging, long-term social benefits rather than more narrowly measured economic goals such as cost cutting or greater efficiency. At the same time certain governance practices and decisions, as we will see in more detail below, have tended to obstruct whilst others have been more supportive of niche innovations and low carbon transition than others.

This suggests that this transition is one that is relatively more directed, or politically instigated, and this is one more aspect that marks it out from some previous transitions that are understood to have been relatively more ‘organic’ and undirected in nature (Scrase and Smith 2009: 709; cf. Fouquet 2010).⁶ Debates in technology policy have shifted towards the conclusion that governance must be designed such that policies can catalyse fundamental, system-wide, low carbon change (Kern 2011: 300; cf. Foxon and Pearson 2007; Meadowcroft 2005; van den Bergh et al 2007). This conclusion ties in with scholars of the politics of climate change who also argue for a central role for governance within transition (Carter 2007; Freeman 1996; Giddens 2009; Mitchell 2008). Much of the work on governing for transition is focused on the all important niche markets that are vulnerable until the diffusion stage. What is therefore needed is a protected market within which niches have time to develop, to learn by doing and to enable technological refinements (Fouquet 2010: 6594). Given the current lack of willingness observed by Fouquet and others to pay higher prices for niche, low carbon products it is proposed that governments, and other state and international organisations, act to directly support innovation at the niche level. This approach, the protection and development of promising new technologies, is referred to as ‘strategic niche management’ (Kemp et al 1998). Some scholars observed that debates about the role of governance tended to be too neutral and apolitical and out of this critique there emerged a new approach called ‘Transitions

⁶ Although Carlota Perez would point out that the state played a heavy role in the diffusion/mass roll out phase of various new technologies (Perez 2002).

Management' (TM).⁷ This approach was even more normative in its vision of the politics of low carbon transition in that it defined an instrumental, practice oriented model for the kind of governance that would be most appropriate in destabilising regimes and supporting niche innovations and low carbon transition (Markand et al 2012: 958). It combined insights from sociotechnical transitions with insights from complex systems theory (cf. Kauffman 1995) and governance approaches (Rotmans et al 2001). It suggested that governance could be an enabler of change not just through directly supporting niche innovations, but also by becoming a site for learning and knowledge and by supporting linkages between the niche and regime levels (cf. Schot and Geels 2008). Governments should, among others, be responsible for clearly articulating the scientific consensus about environmental pressures as much as it should be responsible for the effective realisation of change in sociotechnical regimes (Smith et al 2005: 1496). TM envisages that low carbon transition can be achieved

...through consensus on visions and through common effort under a process-oriented, interactive style of national policy-making, implementation and learning (Scrase and Smith 2009: 708)

This would all require deliberative, reflexive, co-operative, learning by trying and evolutionary governance processes in order for low carbon transition to succeed (cf. Voß et al 2009).⁸ Furthermore, these changes would need to contribute transition taking place in a socially equitable way (cf. Foxon 2011: 2258).

1.3 Gaps in the Sociotechnical Transitions Literatures

One principal critique of sociotechnical transitions literatures is that even whilst claiming a central role for governance in transitions and whilst emphasising the existence of complex inter-dependencies between areas it does not analyse politics in any great detail, or for that matter political change. Despite the many insights regarding differences between historical and the current low carbon transition some economic historians have openly stated that their approach has not allowed for analysis of broader social, political and cultural forces underway at any particular moment in time (Fouquet 2010: 6591). Clearly MLP and co-evolutionary approaches allow for complex and dynamic interactions across and between various areas, including politics. 'Public policy' is covered with reference to shared beliefs, institutions and the 'regime'

⁷ Interestingly TM formed the basis of renewable energy policy in the Netherlands – one example of theoretical ideas being applied in policy practice. Reviews of the successes and failures of this experiment can be found in: Kern various.

⁸ This conception of governance is similar to aspects of the more deliberative politics suggested by Colin Hay in 'Why we Hate Politics' (Hay 2007). Deliberation is understood as allowing for more informed political agency and choice.

and 'landscape' levels but is not directly analysed. Much analysis has tended to focus on describing individual policies and proscribing what they could or should be rather than questioning the political circumstances that make the adoption of certain policies likely (Meadowcroft 2011: 73). Part of the problem is that as this is a "...challenge oriented agenda..." that focuses more on the direction of transition (Geels and Penna 2012: 2), it is less adept at formulating understandings of the messy politics of the process.

TM, for example, despite extensive debate about the construction of democratic choice of visions and images of the future tends to underplay the politics involved, in this way they fail to fully understand current political configurations that need to give way to their visions of transition governance. For example:

(c)ertain sociotechnical systems may be viewed as unproblematically desirable elements in an equally consensual, equally unproblematic interpretation of sustainability, but others – such as the 'sustainable' nuclear-based energy infrastructure currently advocated in the UK – are clearly not (Shove and Walker 2007: 4)

What tends to happen is that regime transformation is conceptualised as a monolithic process dominated by rational action thereby neglecting important differences in context. The wider political contexts within which transition governance takes place are underestimated and the nature of consensus regarding climate change and environmental pressures is oversimplified making the formulation of visions appear less contested. Certain forms of governance are preferred over others, but not much explanation of how this might be achieved or of whether these forms are institutionally likely in specific contexts takes place. Managed transition can, as a result, come across as being quite straightforward when the reality has, in many countries including the Netherlands where TM was taken up, been quite different (cf. Kern and 2009). As such although sociotechnical transitions differ from technical transitions in that they allow for a constitutive role for culture, interpretive frameworks, historically embedded norms and power structures (cf. Markand et al 2012: 956; Scrase and Smith 2009: 710) more needs to be done to understand these constructed aspects and how they affect policy choices. Moreover, it is claimed that sustainable technology transitions can be better understood as changes mediated by the resources, interests and expectation of institutionally embedded networks of actors (Smith et al 2005: 1508), but how these interests are constructed and defined is not addressed. Questions such as how 'social needs' are defined, why some forms of governance prevail over others within specific institutional contexts or of what prospects for change might be need to be addressed. Answering these questions can also provide explanations as to why it has taken so long for effective climate change governance to emerge.

This paper intends to start filling these gaps by looking at the politics of transition within specific institutional contexts. Recent work has situated low carbon transition within fundamental debates about paradigmatic agency assumptions and types of theory but this work claims to have only scratched "...the surface of interesting topics that deserve more attention in the future" (Geels and Schot 2007: 415). Some of the sociotechnical transitions literatures mention that some countries, Germany, Denmark and Spain for example, have been 'first movers' in managed technological development but have failed to ask why (cf. Fouquet 2010: 6595). Given the wide ranging nature of the research project as a how little time has been given over to following the social, political or cultural peculiarities of individual countries (ibid: 6586). This paper will, in the next section, analyse politics of transition in relation to research that understands governance choices to be related to interpretive frameworks and to concepts that explain variety in institutional contexts using comparative methods (Crouch 2005; Hall and Soskice ?; Schmidt 2009). This will help to explain the wide variety of choices in pursuit of similar low carbon objectives between countries as well as the enduring nature of some forms of transition governance over others.

This paper will go one step further by suggesting that energy transitions take place within institutional contexts that are peculiar to energy, not least in that it is now set towards the achievement of three quite different but complex sets of objectives: climate change, energy security and affordability. Florian Kern's recent comparative analysis of innovations policy in the UK and the Netherlands as pointed to important sectoral differences between energy and other areas (Kern 2011b: 300; cf. Smith et al 2005: 1508). As suggested by Colin Crouch

... if we are to model the diversity of economic institutions more scientifically, and particularly if we are to study institutional change and innovation, we need to deconstruct the wholes that contemporary institutionalism takes for granted and discover their constituent elements... (Crouch 2005: 439)

What is needed is an understanding of how low carbon governance practices are constituted and how they relate to institutional contexts, as well as how they can change.

2. Problematising Governance for Low Carbon Transition

This section offers up some complementary conceptual routes, largely from within historical and sociological institutionalism, through which we can build a better understanding of the politics of transition. This will involve lifting the lid off the thus far somewhat reified politics of transition to understand better how they are constituted. Without rejecting the role of agency, these new institutionalist approaches emphasise the importance of the social construction of policymaking

in that governance is understood as influenced by sets of rules, norms and ideas that infer certain choices over others. Looking at the various ideas and narratives about what the future should look like and how we should get there allows for a more varied, nuanced and complex picture to emerge and for political context to emerge. This section deals therefore in variety – the politics of transition will be conceptualised as taking place at different levels, between different institutions, and as informed by different visions of both the problem and of solutions.

The intention here is not to generalise too widely but to concentrate on the politics of energy governance given the central role of energy in exacerbating climate change. The case for linking climate change and energy is clear – for example in 2011 an estimated 40 percent of UK carbon dioxide emissions came from the energy supply sector and 26 from transport (DECC 2012). The case has been made, however, that changing how we use energy, including new sources and increased efficiencies, can serve also as a solution. As with sociotechnical analyses above for many this implies a central role for governments in transition but also governance change in most countries (cf. Mitchell 2008). This section will focus largely on the politics of transition in OECD countries, with an emphasis on Europe – but even within this confined area there are a number of political approaches to governing for transition each informed by different conceptualisations of energy and how it should be governed.

2.1 Institutional Contexts and Why They Matter

An emergent locus of inquiry within the transitions literatures has been the changing role of various state institutions in relation to environmental problems with moves during the last decades of the 1900s from direct regulation towards market-based solutions (cf. Meadowcroft 2005: 480). This tendency within international and national governing organisations prefer market instruments, such as emissions trading schemes, to change behaviours and to facilitate low carbon transition has been widely critiqued in climate politics literatures (Bernstein 2001; Carter 2007; Giddens 2009; Newell and Paterson 2010). This critique is partly based on the argument that ETSs have not yet successfully produced a consistent carbon price. However, over reliance on market instruments is also contradictory to some of the approaches recommended within the ‘transitions management’ literatures where states are called upon to directly support vulnerable niche innovations, to create new knowledge networks and to pursue reflexive governance. Here, however, we will ask questions about why these choices are made in order to better understand the nature of resistance but also how governance might change.

Sociotechnical transitions scholars have already suggested that one way of proceeding with a better understanding of why certain policy instruments are chosen over others would be through analysing the institutions and ideas that inform specific governance choices (cf. Kern 2011a;

Meadowcroft 2011). New institutionalist concepts in application can tell us much about the dynamics of political problems, about how the problem is perceived, interpreted and placed onto political agendas. They also help explain why certain policy choices are made as well as embedded path-dependencies that not only make change difficult but that can colour what kind of change takes place. This, for example, can help to explain why countries like the Netherlands, Germany and the UK have followed quite different paths towards a more sustainable energy system – with greater and lesser degrees of success (cf. Kern 2011a).

2.1.1 Interpretive Frameworks and Policy Choices

Policy paradigm theory suggests that we can understand policy choices in relation to ideas and institutions. Early thinking on this suggested that policymakers', and other stakeholders', decisions are often influenced and structured by frameworks of ideas referred to as policy paradigms. This interpretive framework importantly colours the ways in which problems are perceived and framed as well as specifying the goals of policy and the instruments that can be used to attain them (Hall 1993: 279). Ideas in this sense are understood at the cognitive level as elite assumptions that *constrain* the range of solutions deemed appropriate and therefore available to policymakers to choose between (Campbell 1998: 385). What is also striking about these interpretive frames is that they can become so embedded within the terminology through which policymakers communicate about their work that they become taken for granted and less amenable to challenge (ibid: 279). One further explanation of the role of ideas in policymaking processes suggests that ideas can be understood as the link between context and conduct and as part of the '*why*' of analysing actions (Hay and Wincott 1998: 953). This infers, in line with early IPE thinking, that ideas and knowledge are forms of power (cf. Strange 1988: 119-138). It is this ability to influence decisions that make ideas so interesting and so important to understand in terms of their relationship with the rule sets, discourses and cultures that sociotechnical transitions scholars reference in terms of regime path dependency (cf. Geels and Schot 2007: 400).

We can take the neoliberal economic paradigm, that has dominated so much economic and energy policymaking over the past few decades, and use it as a brief case study to understand how ideas have influenced choices and with what significance for low carbon transition. Central to neoliberal economic and public choice theories that became so popular within elite policymaking circles is the notion that the state is limited in its ability to govern the economy. Given that energy was partly classified as a 'sector of the economy' freely trading energy markets were understood as being capable of allowing for greater economic and managerial efficiencies, increased competition and less monopolistic practice in energy supply (Webb 1985; Lawson 1989).

What this meant was that the hierarchy of energy policy objectives changed away from a focus on energy security. The principal objectives of energy policy for many countries and international organisations, over the course of the 1980s and 1990s, became the marketisation of energy, increased economic efficiency, lowering of state costs and the reduction of state interference. These goals were pursued through processes of privatisation and deregulation in a number of countries around the world, including in OECD and emerging and transitioning countries (de Oliveira and MacKerron 1992). Once privatised energy companies became the main conduit through which energy policy could be enacted inferring particular power relations between policymakers and private energy industries. In order not to disturb the free functioning of markets policy instruments were chosen that would cause the least amount of disruption to companies (Lawson 1989). For many OECD countries, including the UK which had been an early mover in marketising energy, perceptions of the importance of energy to the economy diminished within the context of increasingly service, consumption and accumulation led economies (cf. Paterson 2012: 357).

Clearly, at this stage, climate change mitigation could not be characterised as a principal objective of energy policy for many countries, with important exception being Germany, Sweden and Denmark. This has recently changed across most OECD countries – climate change mitigation has both moved up the hierarchy of social objectives and become a specific energy policy objective. For example, 192 countries have adopted the Kyoto Protocol, countries like the UK are now committed to reducing carbon emissions by 80% from the 1990 level by 2050 whilst many, especially in the European Union (EU), also have renewable energy targets. These change can be understood as being in large part due to political recognition of growing consensus in scientific knowledge about anthropogenic climate change but also due to realisations that global carbon dioxide emissions have been rising, not falling in order to meet targets. Adoptions of new objectives tie in with MLP suggestions that landscape knowledge can put pressure on sociotechnical regimes to change.

This is, however, where it becomes more complicated and further benefits of understanding governance choices as related to ideas, as context, come to the fore. Once new objectives have been adopted it still remains to be seen if and how they will be met and what instruments will be considered most appropriate in reaching them. The answer for many to this question has already been mentioned above - in a great many cases market-related instruments have been chosen to meet climate objectives. Market economies have been understood by many as sites of innovation and as having the greatest potential for investing in technologies that will underpin transition (cf. Mikler and Harrison 2011: 2).

This is what is sometimes referred to as the ‘compromise of liberal environmentalism’ whereby some environmental ideas, such as the need for climate mitigation, are accepted by political elites whilst others environmental ideas that recommend alternative modes of governance for transition are ignored (Bernstein 2001; cf. Newell and Paterson 2010). It is argued that

... economic ideas overshadowed scientific ideas and ecological thought in producing normative compromises at key junctures in the evolution of the environmental norm-complex over the last thirty years (Bernstein 2001: 190)

Newell and Paterson, in their book on climate capitalism, have observed that by the time responses to climate change became better established, notably in the Kyoto Protocol of 1997, the sorts of strategies being developed had been determined by the dominance of energy companies and other financial actors, given their central role in providing energy services, as well as by neoliberal economic ideologies (2010: 11). This, in turn, relates to the central role of finance within capitalist economies, particularly market economies.

Many argue that these limited choices of policy instrument have been in part responsible for reducing the possibilities for low carbon transition. This is not least because neoliberal economic ideas have been so influential over the choices that policymakers make and at compromising away other ideas, ecological or otherwise, about how to govern for transition. The neoliberal economic paradigm has so far maintained legitimacy amongst various elite groups – this is quite a feat considering the series of crises, financial, economic, energy and climate, that have marked the start of the 2000s.

2.1.2 *Institutionally Embedded Ideas, Power and Path Dependencies*

This power of certain ideas to influence policy choices is one part of answering questions about how the politics of transition are constituted, another is to look at the degree to which such ideas had become institutionalised and with what implications – this helps to explain how political decisions are reached. This relates back to Hall’s observation above that interpretive frameworks can become taken for granted and become difficult to change but also to suggestions from within transitions literatures that regimes, by definition, have a tendency to exclude other options thereby introducing stability, but also path dependencies (cf. Smith et al 2005: 1508). Institutionalised path dependencies and embedded, but taken for granted, ideas can be used as explanations for why the application of transitions management ideas in the Netherlands has not matched researchers’ aspirations (cf. Kemp et al 2007). It turns out that the actual policy context within which transition ideas were to operate was such that there was a previous technological bias meaning that, in the end, sociotechnical became simply technical experimentation (Kern and Howlett 2009: 393). Interestingly also, in keeping with the

hypothesis that transitions management concepts had not properly understood the existing political context, it appears that new goals and instruments were layered on top of others without much thought for compatibilities (ibid: 393).

Not only, therefore, do embedded ideas colour and influence change in the form of new ideas, but they also infer a narrower range of choices. This allows for greater policy predictability than if choosing between a wider array of options and such conditions of relative policy certainty are ones that markets tend to prefer. Certainly there is a preference for policy stability, barring negative profit implications, to conditions of political change and uncertainty that often accompany transitions. Another aspect of embedded paradigms is that they can influence what organisations become involved in economic governance (Kuzemko 2013 forthcoming). With respect to the role of governments, there is little doubt that in recent years there has been a tendency to depreciate their capacity to manage societal problems (Meadowcroft 2005: 492). The idea that the state is relatively, versus the private sector, inept at managing national economies resulted in many countries in a pullback of active involvement by Governments, more responsibility for the private sector in delivering energy goods and services and in new power relations between the state and large corporations in energy sectors.

This, in turn, has in effect resulted in a self-fulfilling prophecy – the depoliticisation of energy and the passing of responsibility for energy provision to the private sector had, as became clear in the UK in the mid-2000s considerably lessened the capacity of government to indulge in the precisely the kind of deliberative governance so recommended by some transitions scholars (Kuzemko 2013 forthcoming; cf. Hay 2007). Deliberative governance is further constrained by the tendency of policymakers working within a policy paradigm to seek advice principally from likeminded institutions and groups – actors that challenge the paradigm or that see the world through different lenses are often sidelined and the paradigm remains uncontested (cf. Schmidt and Radælli 2004; Yee 1996). This situation was arguably most visible in the UK where energy had been depoliticised, particularly in the 1990s, to a degree not perhaps seen in other countries. Up until the end of 2008 there was no Department of State for energy and the division of the Department of Trade and Industry (DTI) that was responsible for energy policy was peopled largely by generalist economists and statisticians rather than energy sector or public policy experts.

By contrast the private sector, particularly large energy and finance companies, have enjoyed a higher degree of influence in that in many countries, the UK included, "... maintaining business confidence and conditions become key state concerns" (Meadowcroft 2005: 492). Given private sector distaste for uncertainty and for policy predictability this inferred further obstacles to radical change in energy policy. Climate change mitigation, as seen above, was successfully

framed in such a way that carbon emissions targets could be adopted without undermining the basic structures of the system. For many political and corporate leaders, given the priority of profit maximisation, the focus was on win/win scenarios and the creation of new business opportunities (ibid: 482). Power, as such, had become a question of successfully framing and representing problems in order to downplay other, potentially viable, alternative framings and solutions (Smith et al 2005).⁹

In principle, therefore, from a neoliberal economic perspective it had been understood that privatisation and liberalisation would open up spaces for innovative alternatives and new technologies. In practice, however, the neoliberal institutional context has applied criteria and imposed requirements that favour some established companies, non-disruptive technologies, which slot relatively easily into the institutional regime. This is, clearly, a somewhat different outcome than that envisaged by the MLP where changes in the landscape, i.e. new scientific knowledge about climate change, would destabilise the existing regime and allow for niche alternatives to enter. In this light, also, the implementation of a reflexive governance programme for transition can be understood as a tall order indeed.

2.2 Models of Capitalism

The path dependencies implied in market approaches to governing energy towards low carbon transition clearly make political change problematic, but these are by no means the only approaches being adopted. Capitalism, as suggested by varieties and models of capitalism concepts, is not monolithic (Crouch 2005; Hall and Soskice 2001; Mikler and Harrison 2011; Schmidt 2002). By understanding political resistance to non-market policy instruments as related to but one model of capitalism we can analyse other models in relation to managed low carbon transition. But observing that there are different approaches to governing energy towards low carbon futures further complicates the politics of transition given possible conflict between approaches. What the adoption of a models of capitalism approach also means is that choices about how to frame the problem and associated solutions have not necessarily been 'right' or 'wrong' but related to interpretive frameworks and beliefs as well as interests and power. The question of how successful choices have been in relation to encouraging niche innovations can still be addressed but within context.

One of the most significant contributions to understanding different forms of capitalism was an edited volume by Peter Hall and David Soskice which suggested that two principal varieties exist: Liberal Market Economies (LMEs) and Co-ordinated Market Economies (CMEs) (2001). This approach referenced earlier work by Michel Albert on Anglo-Saxon and Rhenish

⁹ Frames: ideas as concepts that help policymakers to legitimise policy solutions to the public (Campbell 1998: 385)

capitalisms – the former were characterised as free market economies emphasising individual action and choice and the latter as having more of a capacity to make long-term decisions that maximise collective over individual goods (Albert in Crouch 2005: 441; cf. Berlin 1977: xvii). Hall and Soskice conceptualise LMEs and CMEs ideal types further, whilst recognising that countries are more likely to find themselves somewhere on the continuum between such ideal types. LMEs, the US, UK, Australia, Canada, New Zealand and Ireland, are identified as pursuing neoliberal economic policies in line with the policy paradigm outlined above. CMEs, such as Germany, Sweden, Finland, Denmark, are associated with social democracy, greater collective capacities and are countries where social and political institutions engage directly, on an ongoing basis, in shaping the economy (Hall and Soskice 2001).

Vivien Schmidt has proposed that there are three models of capitalism even within Europe: ‘market’, similar to LMEs; ‘managed’, likewise similar to CMEs; and ‘state’ models, such as in France, which are more actively interventionist. Moving on from the varieties of capitalism approach, which concentrates on economic relations, she emphasises the importance of political discourse, or how problems are both framed and communicated. She identifies two principal forms of discourse, ‘communicative’, found most often in centralised systems like the UK or France, and ‘coordinating’, more typical of Germany. The former tends to inform the public of what needs to be done; the latter, coordinating discourse, is used to develop consensus among powerful actors who cannot be controlled from the centre (Schmidt 2001 in Crouch 2005: 447). We can bring back observations made above that some market liberal economies, by taking steps to depoliticise energy, have ultimately ended up with little political capacity to govern in a deliberative, reflexive manner. This observation, in combination with Schmidt’s explanation of the British discourse model as one that directs from the centre, helps us to understand how difficult it would be for the British model of market capitalism to embrace, for example, the reflexive, network building form of governance recommended in ‘transitions management’.

These are reasons why some models of capitalism are understood to be more suited to governing for low carbon transition than others especially given observations within sociotechnical transitions literatures about the need for managed over organic transition. There are other reasons that take us back to other interpretive frameworks, this time in the form of public sentiment, that prioritise individuals over collectives.¹⁰ For example it is claimed that

¹⁰ See Campbell’s ‘ideas as public sentiments’ that can constrain or enable solutions available to policy makers (Campbell 1998: 385)

(t)he type of individuality encouraged by neoliberal visions of capitalism, in particular, discourages consciously coordinated collective action and that is clearly necessary to overcome a global catastrophe (Mikler and Harrison 2011: 2)

CMEs, by contrast, given more widespread support for notions of collectives and ongoing processes of co-ordination, can better enable the coexistence of high levels of economic performance alongside the pursuit of other social goals not as available to purer market economies (Crouch 2005: 441).

Germany, the archetypal CME, is perhaps not surprisingly therefore also held up as being more successful in supporting new energy technologies, through institutions such as the KfW bank and the adoption of command-and-control policies, in designing and co-ordinating long term plans for transition, and in establishing new industries around these new technologies (cf. Meadowcroft 2011; Mitchell 2008).¹¹ The model of capitalism approach in application here has helped to explain *why* it has been easier for Germany, as a CME, to take this transition route as opposed to LMEs, such as the US or UK. Germany has pursued a managed transition, in line with conceptualisations of it as a CME, because the relevant ideas and institutions were already in place: it tends to adopt a ‘co-ordinated’ form of discourse, long-term coalition building is part of its institutional make-up, and there is more deeply entrenched public sentiment in support of notions of collective action to reach social goals. Arguably, what has also enabled active political pursuit of low carbon transition in Germany has been the higher degree of popular support for ‘green’ ideals and wider spread belief in the notion of anthropogenic climate change.

2.3 Energy Governance Specifics

The section above has taken us beyond political questions about appropriate roles for states and markets in economic governance that the previous section highlighted to consider the role of other ideas, for example about individualism and collectives, how governments communicate with other areas and about anthropogenic climate change. This brief sub-section moves on to consider some aspects of the politics of energy transition that are more specific to energy as a sector. It should be noted that historically, especially during diffusion phases, states in almost all countries have taken a central role in supporting various energy sectors – not least in the roll out of national electricity systems (cf. Kuzemko 2013 forthcoming; Perez 2002). In order to make this point further we can refer again to Colin Crouch’s work on models of capitalism to observe that beneath generalisations about market, co-ordinated and state economies there

¹¹ These observations directly contradict claims made by Hall and Soskice that LMEs are better at producing radical innovations and developing ‘future-oriented’ sectors of the economy whilst CMEs are more likely to have declining economic sectors (Hall and Soskice 2001).

exists a wider variety of political choices and actions within individual countries (Crouch 2005: 442).

Crouch has observed that even within market economies responsibility for public goods lies with the state. Examples of this are provision in many LMEs of medical, educational and welfare goods. The US federal state has supported specific sectors through direct investment in research and development, for example to help develop hydraulic fracturing in the gas industry. Crouch gives this striking example:

... an extremely powerful, scientifically oriented military sector, tying a number of contracting firms into close... relations with central government departments, is a fundamental attribute of the US economy, and central to much of its innovative capacity in such sectors as aerospace and computing (Crouch 2005: 442)

This observation contrasts with neoliberal assumptions about freely trading markets as principal sites for innovation, but it also begs the questions of how and why some areas are chosen for state support and investment over others. Clearly some services can be understood as national public goods, whilst others are not, but understanding how are these decisions are made is both difficult but important in further understanding a wider array of potential low carbon governance choices.

It suggests also that there are specificities as to how certain sectors are perceived. Energy in many non-OECD producing countries is perceived as having a very particular socio-economic role and energy companies are owned and run by the state. This relates in many instances to the percentage of GDP that comes from export revenues associated with energy, but also to perceptions of energy companies as national, collective and/or strategic assets. Security of demand is as, if not more, important than security of supply. This gives energy, in these countries, a fundamental socio-economic role such that even if other sectors are not nationalised, for example in Russia, energy is which makes energy, as an area, quite specific in terms of governance choices. Furthermore energy, in the form of electricity or fossil fuels, is still subsidised in consumer as well as producer countries due to its role in underpinning economic growth and in providing jobs and a certain quality of life. These subsidies clearly provide resistance to energy solutions to low carbon transition, such as new efficiency technologies, but are difficult to break in many countries given existing social contracts. This in turn takes us back to Florian Kern's claim above that there are sector specificities that also feed into the context within which the politics of transition take place (2011b: 300).

One last, related observation about specificities of the politics of energy that need to be understood in relation to how the politics of energy transition are constituted is that energy policy is set in most countries to a range of different objectives (cf. Kuzemko 2013 forthcoming). Climate mitigation may have crept up the hierarchy of energy policy objectives but it exists alongside other objectives informed by ideas about the need to establish and maintain energy security as well as others that emphasise energy as part of economic development and poverty alleviation. There may well be trade offs between these objectives at points in time but what is worth emphasising at this stage is that there are different 'selection pressures' upon areas of policymaking that need to be taken into account when understanding how the politics of energy transition are constituted (cf. Smith et al 2005).

3. Prospects for Change

Given the conceptualisation of more successful transition management as being reflexive, co-ordinated and socially acceptable what now for those LMEs, like for example the UK, that have been so far less successful at supporting innovation and producing alternatives including renewable energy? The implication is that governance change is needed and we can go about answering this question by bringing in conceptualisations of political change also from within historical and ideational institutionalisms. Policy paradigm theory, often with reference back to shifts in economic policymaking to Keynesianism in the 1940s and to neoliberal economics in the 1980s, suggests that radical political change can and does happen (Blyth 2002; Hall 1993; Hay 1996). In line with conceptualisations of how the politics of energy transition are constituted, these approaches also stress the role of ideas and narratives within processes of profound structural change and in many respects understand change in ways not dissimilar to sociotechnical transitions literatures. Policy paradigm change concepts can impart important information about how and *why* political change can take place, thereby filling gaps in sociotechnical transitions concepts of change, but can tell us less about how structural change in governance practices would interact with other areas.

This section introduces policy paradigm change concepts not only to better understand political change but to also understand better the current context, in the form changes ongoing in UK energy governance, as well as to ask questions about prospects for more radical change. It should be said up front that there are some changes already ongoing in UK energy governance, the Government has started intervening more directly to support renewable technologies and energy has to an extent been repoliticised in that there is now more dedicated political capacity in place, not least in the form of the Department of Energy and Climate Change (DECC). This process is still arguably shackled by the *kinds* of path dependencies, outlined above, more typical of a market economy. For example resistance to more radical change can be found in

the relative power of large incumbent corporates vis-à-vis policymaking institutions such as DECC, in a lack of popular support for notions of anthropogenic climate change and collective action, and in a continuing belief in some elite circles in neoliberal economic governance (cf. Kuzemko 2013 forthcoming). The dominance of private finance in this kind of capitalist economy,¹² combined with the central role of private enterprise as conduits through which new policies are to be delivered, has tended to keep the current sociotechnical regime, built around fossil fuel sourced centralised generation, in place – hampering the entrance of niche and renewable alternatives.

Just as certain ideas, as paradigms, are conceptualised above as underpinning certain path dependencies they are also understood as being capable of enabling change – even and especially of more radical proportions. As with sociotechnical conceptualisations of transitions a paradigm shift, again with reference to Thomas Kuhn, implies a fundamental departure from existing practices but the policy paradigm shift is based upon new and alternative ideas about how to govern and to what ends (Blyth 2002; Meadowcroft 2005 cf. Kuhn 1962). This can be measured by assessing change at each level of governance – ideas about governance, the objectives and instruments of policy and actual institutions of governance (Kuzemko 2013 forthcoming). It can also be measured by ascertaining whether new ideas and solutions become embedded within political institutions such that the new paradigm can really take hold on an ongoing basis – this might only occur after some considerable struggle between supporters of alternative paradigms (Oliver and Pemberton 2004).

The MLP have conceptualised transition as something that takes place over extended periods of time and as evolutionary, but scholars also suggest that regimes need to become destabilised in order for niche innovations to break through. This understanding of change as a process is reflected in one strand of ideational institutionalism that understands change in terms of punctuated evolution. It is characterised as:

...a discontinuous conception of political time in which periods of comparatively modest institutional change are interrupted by more rapid and intense moments of transformation (Hay 2002: 161)

These intense moments of transformation may well coincide with moments of perceived crisis and crisis is, as such, characterised as a moment of uncertainty but also of political possibility (Hay 2002). The association of crisis, uncertainty or shock with opportunity for change is

¹² It is this same power of private finance in LMEs that has arguably prevented radical political change in response to the financial and ongoing economic crises (Newell and Paterson 2010).

common across a wide range of very different academic disciplines, ecology, psychology, sociology, biology, economics and technology studies, in that crises are understood as indicative of problems that require response in the form of change (cf. Verbong and Loorbach 2012: 6; Widmaier et al 2005: 748).

What is of particular importance for understanding how policy change relates to crisis is the notion that such moments, given degrees of uncertainty and shock, provide opportunities to open up even embedded policy paradigms to scrutiny, debate and challenge (Blyth 2002; Hay 1996). As a crisis debate creates deliberative spaces it is at these junctures that alternative narratives, based on different sets of ideas about how to govern and to what end, can be heard and can challenge the existing paradigm. During such moments the existing paradigm can become, in this way, amendable to scrutiny. This is partly also because crises are not necessarily self-apparent phenomena and as such they need to be explained and so narratives, in that they explain but also express alternative views, are understood to be central to processes of structural change (Blyth 2002: 9). This kind of understanding of change is also fundamental to discourse analysis which suggests that language not only shapes political action and practices but can become a central form of agency for political actors (Yee 1996; Geddes and Guiraudon 2004; Schmidt 2006).

Clearly, the notion of agency is important to consider when change to deeply structured, path dependent political practices is being contemplated. Narratives can infer agency on political protagonists in a number of ways: first in helping to convince wide audiences that a crisis does, indeed, exist; in explaining what has gone wrong; in arguing that change is needed given failures in existing governance practices; and in then providing alternative solutions in line with their explanation of what has gone wrong (cf. Blyth 2002). This conception of change suggests that proof of current policy failure is important as it is through this mechanism that the need for policy change can be proven – i.e. part of the problem needs to be understood as being endogenous to existing governance practices. A policy paradigm shift can then take place based on which crisis narrative prevails by convincing stakeholders and wider publics that they have the best solutions that will restore certainty. Given the need to bring wider publics along a successful narrative will also need to appeal to existing, or emerging, norms, values and understandings (Schmidt 2006: 252). Narratives that fail to do so may fall on deaf ears and so the way in which arguments for change and solutions offered are framed, so that they can be convincing across multiple audiences, is of vital importance.

The example so often given of a successful structural change in politics is the shift towards neoliberal economic governance that arguably started in Britain with explanations of 1970s crises as government overload – the obvious and simple answer being for the state to do less

(Hay 1996). This paradigm shift might here be understood, in MLP terms, as a successful destabilisation of the existing governance regime by new knowledge at the landscape level about how to govern the economy (cf. Foxon 2011: 2259). When we think about low carbon transition and how alternative narratives, such as ‘transitions management’ or Voß et al’s reflexive governance, might inform further shifts away from the UK’s pro-market style of energy governance a number of extra layers of complexity are added (cf. Rotmans et al 2001; Voß et al 2009). As already noted the notion of change occurring through such processes as pooling knowledge, collaborative learning and joint initiatives, as suggested in the MLP, is more suited to a co-ordinated than market economy. But this description can be understood not only as a path for change it could also apply as an end goal in itself - the type of governance system that many would like to see adopted in the UK.

What can also be noted is that there are, at the moment, a number of different crises being experienced and perceived simultaneously in the UK and across Europe –energy, financial, climate and economic. In addition, perhaps unsurprisingly, there is a range of alternative paradigms being proposed as solutions (cf. Helleiner 2004). Even if we narrow down to think about UK energy crisis debates since 2007 we are faced with at least three principal arguments, based on different schools of thought, alternative visions of how to understand energy and how to govern it: embedded liberalism, geopolitics/economic nationalism and ecology (Kuzemko 2013 forthcoming). And within these three alternatives there are disagreements, sub-sets and alliances – one obvious example being the tendency for climate change protagonists in the UK, who focus almost exclusively on climate change over other environmental issues, to draw on geopolitical arguments to argue for home grown renewables. This energy security-climate narrative that frames the problem in terms of a combined insecurity of energy supply and climate change crisis offers ‘home-grown’ renewables and energy efficiency as solutions to both crises. This is not the kind of problem framing and solution offering envisaged within ideational institutionalism where simple, coherent narratives are understood to be capable of restoring certainty (cf. Hay 1996; Blyth 2002).

To make things more complicated although UK energy governance practices have altered to respond to the energy security-climate framing of the problem, not least in the creation and design of DECC such that it would combine energy and climate policy, the influence of the pro-market paradigm persists. By no means have notions of direct state intervention pursued through reflexive and consensus building practices been embraced by UK energy elites – instead what appears to have happened is a form of inter-paradigm borrowing between pro-market, ecological and geopolitical/economic nationalist schools of thought. This is an energy governance system that is overly complex, still changing, trying to respond to a range of new objectives, and continues to communicate from the centre. It is not an energy system built upon

an informed, well-deliberated, reflexive and coherent set of ideas about how energy governance can be designed to achieve low carbon transition.

4. Conclusion

Does this mean that the UK, as a country with deeply embedded market and individualistic preferences and a lack of widespread popular belief in anthropogenic climate change, can never adopt a more reflexive, sustainable and consensus building form of governance? Clearly policy paradigm changes have happened in the past – Britain did practice embedded liberalism for a number of decades before returning to more market oriented ways. But given evidence from historical economists about the unprecedented nature of low carbon transition and timing issues in combination with specific ideational and energy contexts explaining the problem as a whole and offering acceptable solutions will require considerable further research, insight, tenacity and effort.

If we are to stick, however, to the conceptualisation offered here of how structural political change can be achieved what is required in part is a reframing of the debate whilst cognisant of specific contexts. There is little doubt that a climate crisis still exists and that debates about how to solve this problem persist – the window for challenging current UK energy policy is still open. As suggested within sociotechnical transitions literatures what is required is a continued “questioning and destabilisation” of existing beliefs (Geels 2010: 500), but to do this we need to create clearer explanations of what those existing ideas are and how they are failing to inform successful low carbon governance choices and support for alternative technologies. The debate also needs to be extended beyond existing political, NGO and think tank communities to involve a national conversation framed in a way that allows for complex infrastructures and politics but also make the necessities of and possibilities for low carbon transition much more tangible. A range of solutions in terms of innovative technologies and governance practices already exist but more needs to be done to relate these to specific contexts such as the UK. Social transformation could be framed as allowing for greater public participation, availability of information, new industries and centres for growth but also as modern, real and technologically exciting.

One further way to reframe the argument for UK audiences could be to build a coalition between those that want to encourage a less service-oriented, consumption led economy, those that want to see a greater role for state spending in boosting economic growth and those that want a more sustainable, equitable, low carbon future. As part of this reframing support for niche innovations could be encouraged by reconceptualising welfare to include investment in small and medium sized companies looking develop alternative technologies and/or to compete with

large and established incumbents. This might equate to a reconceptualisation of a low carbon economy as akin to a public good that all should have access to. To the extent that corporate welfare already exists in many market economies, including the UK, this would involve a redirection of state funding from one set of corporates to another and is thus one solution that is relevant to the UK context (cf. Farnsworth 2012).

In returning to the conceptual purposes of this paper a closer analysis of the politics of transition has helped us to reveal and better understand some of the complexities in the form of relationships between energy governance and wider political structures and in the form of specificities of energy as an issue and policy area. It seems clear that these specific contexts are important to low carbon governance decisions made as well as to how change is pursued. What might assist here is comparative analysis that considers how energy has been governed for low carbon transition elsewhere and then considers those within the context of UK institutions and their potential for change. Further work, in addition, needs to be done to understand how to integrate concepts of policy paradigm change with those of sociotechnical change. For example, in consideration of the many inter-related areas within a sociotechnical transition, conceptualisations of policy change would have to be expanded outwards to include impacts upon other areas such as industry, technology and society at large.

Bibliography

- Bernstein, Steven (2001) *The Compromise of Liberal Environmentalism*. New York: Columbia University Press.
- Bernstein, Steven (2005) 'Legitimacy in Global Environmental Governance', *Journal of International Law and International Relations* 1-2 (2004-5), 139-167.
- Blyth, Mark (2002) *Great Transformations: Economic Ideas and Institutional Change in the Twentieth Century*. New York: Cambridge University Press.
- Campbell, John L. (1998) 'Institutional Analysis and the Role of Ideas in Political Economy', *Theory and Society* 27, 3, pp. 377-409.
- Carter, Neil (2007) *The Politics of the Environment: Ideas, Activism, Policy: Second Edition*. Cambridge: Cambridge University Press.
- de Oliveira, Adilson; MacKerron, Gordon (1992) 'Is the World Bank approach to structural reform supported by experience of electricity privatization in the UK?', *Energy Policy* February 1992, pp. 153-162.
- DECC (Department of Energy and Climate Change) (2012). 2011 UK Greenhouse Gas Emissions, Provisional Figures and 2010 UK greenhouse gas emissions, final figures by fuel type and end-user. Available at <http://www.decc.gov.uk/assets/decc/11/stats/climate-change/4817-2011-uk-greenhouse-gas-emissions-provisional-figur.pdf>
- Farnsworth, Kevin (2012) *Social versus Corporate Welfare*. Basingstoke and New York: Palgrave Macmillan.
- Fouquet, Roger (2010) 'The slow search for solutions: Lessons from historical energy transitions by sector and service', *Energy Policy* 38 (2010), 6586-6596.
- Fouquet, Roger (2008) *Heat, Power and Light: Revolutions in Energy Services*. Cheltenham UK and Northampton MA: Edward Elgar.
- Foxon, T.; Pearson, P.; Makuch, Z.; Mata, M. (2005) 'Transforming policy processes to promote sustainable innovation: some guiding principles', *a report for policy makers*. London, Imperial College.
- Geels, F.; Schot, J. (2007) 'Typology of sociotechnical transition pathways', *Research Policy*, 36, 399-417.
- Grubb, M.; Haj-Hasan, N.; Newbery, D.(2008) 'Accelerating innovation and strategic deployment in UK electricity: applications to renewable energy', in M. Grubb, T. Jamasb, M.G. Pollitt (eds.) *Delivering a*

Low-Carbon Electricity System: Technologies, Economics and Policy. Cambridge: Cambridge University Press.

Hall, Peter (1993) 'Policy Paradigms, Social Learning, and the State: The Case of Economic Policymaking in Britain', *Comparative Politics*, 25, 3, pp. 275-296.

Hall, Peter; Soskice, David (2001) 'Introduction', in Peter A. Hall and David Soskice (eds.) *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. Oxford: Oxford University Press.

Hay, Colin (2007) *Why We Hate Politics*. Cambridge; Malden SA: Polity Press.

Hay, Colin (1996) 'Narrating Crisis: The Discursive Construction of the Winter of Discontent', *Sociology* 30, 2, pp. 253-277.

Hay, Colin; Wincott, Daniel (1998) 'Structure, Agency and Historical Institutionalism', *Political Studies*, XLVI, pp. 951-957.

Helleiner, Eric (2004) 'Economic Liberalism and Its Critics: The past as Prologue?', *Review of International Political Economy* 10, 4, pp. 685-696.

Jefferson, M. (2008) 'Accelerating the transition to sustainable energy systems', *Energy Policy* 36, 11, 4116-4125.

Jordan, Andrew (2007) 'The governance of sustainable development: taking stock and looking forwards', *Environment and Planning C: Government and Policy* 2008, 26, 17-33.

Kemp, R; Rotmans J.; van Asselt, M. (2007) 'Assessing Dutch energy transition policy: how does it deal with dilemmas of managing transitions?', *Journal of Environmental Policy & Planning* 9, 3, 315-331.

Kemp, R.; Schot J.; Hoogma, R. (1998) 'Regime shifts to sustainability through processes of niche formation: the approach of strategic niche management', *Technology Analysis & Strategic Management* 10, 175-195.

Kern, Florian (2011a) 'Ideas, institutions, and interests: explaining policy divergence in fostering 'system innovations' towards sustainability', *Environment and Planning C: Government and Policy* 2011, 29, 1116-1134.

Kern, Florian (2011b) 'Using the multi-level perspective on socio-technical transitions to assess innovation policy', *Technological Forecasting & Social Change* 79, 298-310.

Kern, Florian; Howlett, Michael (2009) 'Implementing transition management as policy reforms: a case study of the Dutch energy sector', *Policy Sciences* 42, 391-409.

Lawson, Nigel (1989) *Energy Policy: the Text of a Speech Given in 1982*. Oxford: Clarendon Press.

MacNeil, Robert; Paterson, Matthew (2012) 'Neoliberal climate policy: from market fetishism to the developmental state', *Environmental Politics* 21, 2, 230-247

Markand, Jochen; Raven, Rob; Truffer, Bernhard (2012) 'Sustainability transitions: An emerging field of research and its prospects', *Research Policy* 41 (2012), 955-967.

Meadowcroft, James (2011) 'Engaging with the politics of sustainability transitions', *Environmental Innovations and Societal Transitions* 1 (2011), 70-75.

Meadowcroft, James (2005) 'From welfare state to ecostate', in J. Barry and R. Eckersley (eds.) *The State and the Global Ecological Crisis*. MIT Press.

Newell, Peter; Paterson, Matthew (1998) 'A climate for business: global warming, the state and capital', *Review of International Political Economy* 5, 4, Winter 1998, 679-703.

Newell, Peter; Paterson, Matthew (2010) *Climate Capitalism: Global Warming and the Transformation of the Global Economy*. Cambridge: Cambridge University Press.

Oliver, Michael and Pemberton, Hugh (2004) 'Learning and Change in 20th-Century British Economic Policy', in *Governance: An International Journal of Policy, Administration, and Institutions*, 17, 3, pp. 415-441.

Paterson, Matthew (2005) 'Legitimation and Accumulation in Climate Change Governance', *New Political Economy* 15, 3, 345-368.

Penna, Caetano C. R.; Geels, Frank W. (2012) 'Multi-dimensional struggles in the greening of industry: A dialectic issue life-cycle model and case study', *Technological Forecasting & Social Change* 79 (2012), 999-1020.

Perez, Carlota (2002) *Technological Revolutions and Financial Capital*. London: Edward Elgar.

Rotmans, Jan; Kemp, René; Van Asselt, Marjolein (2001) 'More evolution and revolution: transition management in public policy', *Foresight* 3, 1, 15-31.

Schmidt, V. A. (2006) *Democracy in Europe: The EU and National Politics*. Oxford: Oxford University Press.

Schmidt, Vivien (2002) *The Futures of European Capitalism*. Oxford: Oxford University Press.

Schmidt, V.A. and Radaelli, C. M. (2004) 'Policy Change and Discourse in Europe: Conceptual and Methodological Issues', *West European Politics*, 27, 2: 183-210.

Schot, J. W. (1998) 'The usefulness of evolutionary models for explaining innovation. The case of the Netherlands in the nineteenth century', *History of Technology* 14, 173-200.

Scrase, Ivan; Smith, Adrian (2009) 'The (non-)politics of managing low carbon socio-technical transitions', *Environmental Politics* 18, 5, 707-726.

Shove, Elizabeth; Walker, Gordon (2010) 'Governing transitions in the sustainability of everyday life', *Research Policy* 39 (2010), 471

Smith Adrian; Raven, Rob (2012) 'What is a protective space? Reconsidering niches in transitions to sustainability', *Research Policy* 41 (2012), 1025-1036.

Smith, A.; Stirling, A.; Berkhout, F. (2005) 'The governance of sustainable socio-technical transitions', *Research Policy* 34, 10, 1491-1510.

van den Berg, J.C.J.M.; Faber, A.; Idenburg, A.M.; Oosterhuis, F.H. (2007) *Evolutionary Economics and Environmental Policy: Survival of the Greenest*. Cheltenham and Northampton M.A.: Edward Elgar Publications.

Verbong, Geert; Loorbach, Derk (2012) 'Introduction', in Geert Verbong and Derk Loorbach (eds.) *Governing the Energy Transition: Reality, Illusion or Necessity?*. Abingdon and New York: Routledge.

Voß, Jan-Peter; Bauknecht, Dierk; Kemp, René (2006) *Reflexive Governance for Sustainable Development*. Northampton MA: Edward Elgar.

Webb, Michael G. (1985) 'Energy policy and the privatization of the UK energy industries', *Energy Policy* February 1985, pp. 27-36.