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Accelerating Carbon Reduction in the Field of Local Authorities: From tales to themes to transition?

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Extended Abstract

The inter-related 'big issues' of our time of which climate change, loss of species and social injustice are headline examples call for a large-scale and mindful transition to a more sustainable society. Current sociotechnical theory suggests that a societal transition on this scale can neither be controlled nor confined to the deployment of new technological solutions (Rayner and Malone 1998; Rip and Kemp 1998). It will result instead from a complex process of co-evolution across all sectors where the broadly defined ways of doing thing – the current sociotechnical regime - is challenged and reconfigured (Kemp 1994; Rotmans, Kemp et al. 2001; Geels 2002).

This outline paper offers some insights from research within the institutional field of UK Local Government where it is proposed such a reconfiguration might be underway. From this research a set of 6 themes that recur across several breakthrough projects have been derived. These are summarised and the insight they offer into the human dimension of transition is discussed. The approach of the research, which is narratively oriented action research, is then proposed as a valuable complement but also a challenge to current sociotechnical theory. This paper outline starts with an overview of one compelling visualisation of current sociotechnical thinking: the multi-level model of sociotechnical transition as proposed by Frank Geels (Geels 2002; Geels and Schot 2007)

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The backdrop of sociotechnical theory

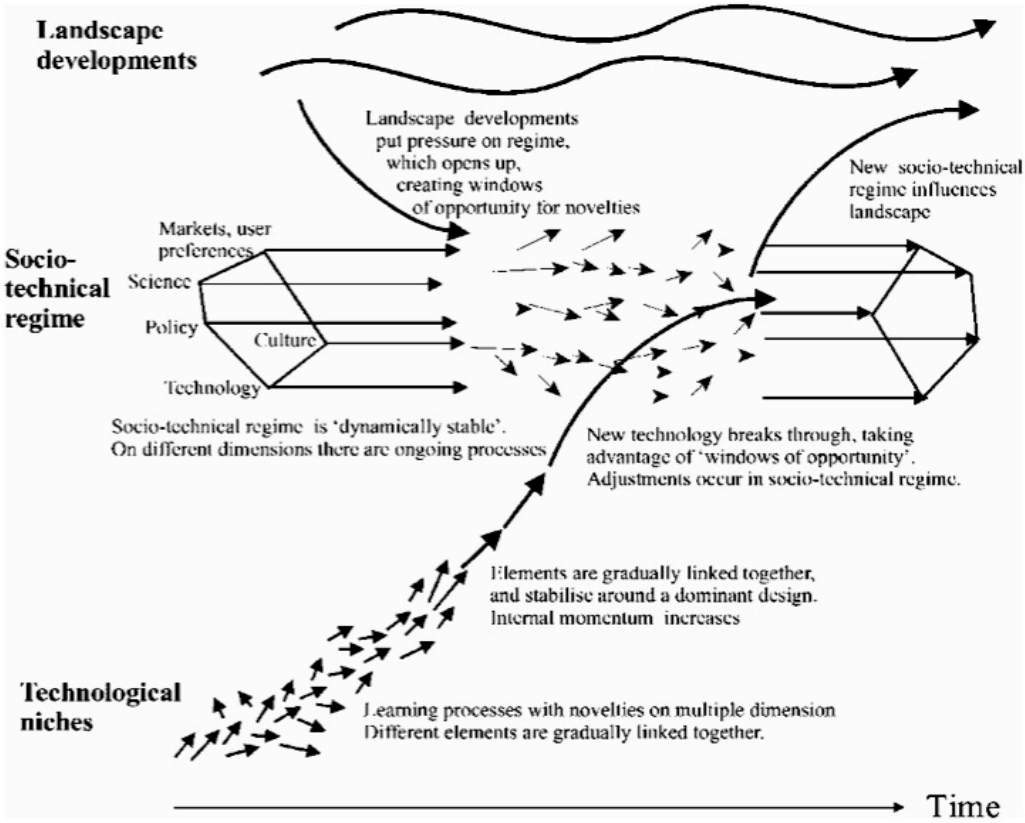


Figure 1 Geels' Multi-level perspective on transitions. Source: (Geels 2005 p.452)

The multi-level transition perspective as visualised above by Frank Geels is the result of a detailed working and integration of ideas from evolutionary economics, sociology and science and technology studies (STS) by several, mainly Dutch, scholars over the past decade. These scholars have been particularly concerned with understanding the transition to environmental sustainability and have come to conceptualise it as resulting from the interaction of different levels of sociotechnical activity in a 'niche', 'regime' and 'landscape' (Kemp and Soete 1992; Kemp 1994; Rip and Kemp 1998; Geels 2002).

The rigidity of the term regime conveys the central idea that system-wide change is limited in its trajectory. The different dimensions of society, for example policy, market, science, technology, culture, all interlock to create an underlying rule-set of how things are done. The result is a dynamic stability, a regime, that represents '*a frontier of achievable capabilities*' (Nelson and Winter 1982 p.258). In socio-technical theory, transition is defined as occurring when the current regime is subject to a pincer movement of upward and downward pressures. A changing external landscape that includes cultural, macro-political and macro-economic trends can become misaligned with the current regime and so exert downwards pressure on it. Meanwhile in the sociotechnical niches, the petri dishes of new regimes, new ways of organising and doing technology are being articulated. These exert upwards pressure on the current regime.

These pressures, together with changes within the regime itself can open up windows of opportunity for reconfiguration to occur. This is the theory of sociotechnical transition that has, because if its intellectual rigor and its explanatory power, gained much attention from environmentally oriented researchers and policy makers alike this past decade.

Their attention has been turned in a number of directions. For example, drawing on the multi-level perspective researchers have been able to explain the lack of success of certain sustainable approaches not as a failure in technology, but rather as a misalignment across the market, policy and consumer regimes that needed to interlock in order to make breakthrough possible (Raven and Verbong 2004). Or scoping out to a broader historical timeframe, the ideas have also been brought to life with an explanation of the vagaries and chaos of past system-wide transitions such as that from horse-drawn carriage to modern day automobile (Geels 2005). Complementing this work, policy researchers have also been exploring how these ideas might not only explain past transitions but also inform how a future, more purposeful transition might be governed (Smith, Stirling et al. 2005) or how transition pathways to a low carbon economy might be created (Foxon, Hammond et al. 2008). At the policy level, the 'transition approach' termed also as 'strategic niche management' attempts to draws on the sociotechnical view to refocus policy away from directive policy instruments towards more deliberative, facilitative styles of policy making (Rotmans, Kemp et al. 2001).

In summary then, and in danger of simplifying, current sociotechnical research can be broadly divided into having a post-hoc or future-facing orientation. To date there has been little attention on the actual experience of transition and it is here that this paper is contributing a perspective.

In this outline paper the question of 'how a system-wide transition might occur' is turned on its head and becomes 'what can we learn from places where transition seems to be occurring?' The next section suggests that the site of the research described in this paper is one such place.

Local Government in the UK: A regime in transition?

Local Government in the UK has been the location for one stream of the Lowcarbonworks action research program that is the subject of this paper. Contrary to its reputation as a slow and risk-averse bureaucracy, Local Government has been the site for a series of innovative, low-carbon related projects over the past decade. The following five projects have been featured in this research.

The first two projects do not use low-carbon technology directly but stimulate its use in different ways. In 2003 the London borough of Merton spearheaded a groundbreaking piece of policy that stipulated that henceforth new commercial and housing developments beyond a certain size would need to supply 10% of their projected energy needs with on-site renewable technologies. This policy, dubbed the Merton Rule, was unique in how it originated in local government and also in how it successfully spread and was adopted by over half the local authorities in the country. The second example also featured an idea that related to sustainable practice and that spread through the country. Just after the Millennium, in Nottingham, a declaration to tackle climate change was created. Local

Authorities were encouraged to sign and so declare a commitment to act on climate change. By 2009 over three-quarters of the Local Authorities in the country have now joined in to voluntarily sign it. The remaining three projects featured in the research directly use low-carbon technology. In the northern town of Huddersfield, an area called Primrose Hill that was formerly known to be one of the most deprived wards in the country has become the UK's unlikely 'sun village'. It represents the council of Kirklees's continued commitment to the use of solar energy that has led to solar thermal and solar PV installations on social housing, care homes and luxury flats across the borough. Meanwhile in the neighbouring metropolitan borough of Barnsley it is wood-based biomass that is reducing carbon. Barnsley was formerly heavily dependent on coal. With cabinet backing it is now running a large-scale switchover to locally supplied wood which is heating an increasing proportion of its council houses and offices. The initiative sets them on track to have reduced their 1990 levels of heat-related carbon emissions by 60% by 2010. Finally in Southampton, a district energy scheme is being run by a partnership between the city council and the energy management company Utilicom. The scheme draws on the city's geothermal waters and uses this together with combined heat and power and absorptive cooling technology to supply heating and cooling to several city centre buildings. The scheme is estimated to be saving some 11,000 tonnes of CO_2 annually for commercial and public sector clients.

These projects are varied in the technologies they use and the approaches they have taken. If sustainable local government is an ideal necessitating innovation then they might be understood as niches that challenge the incumbent regime. Or to draw on innovation theory they are sites of variation and 'ferment' in an era of experimentation and chaotic change as the field of Local Government mounts a response to climate change (Anderson and Tushman 1990). In terms of how new ideas diffuse, they represent the early adopters of sustainability ideals (Rogers 1962) or more lyrically they might represent a living 'canary in the mine'. If the figural canary is being sent to find out if institutions, structures and people can reconfigure to address climate change then it might just return with some breath in its lungs from Local Government. The question is why?

The unique institutional nature of Local Government is the most likely reason. The pressures to respond to issues like climate change are felt more keenly there than in other sectors. Local Government acts as a bridge from central government to local towns and communities, providing infrastructures and services. As such it is a sector that is subject to a medley of social, political and environmental pressures that vary greatly from authority to authority. And overall these pressures differ from the predominantly economic imperative that drives the private sector. Government targets and policy to address climate change make themselves felt early and readily within Local Government. Governmental targets of an 80% reduction in carbon emissions by 2050 and the Climate Change Act passed in November 2008 are two examples of central policies that need to be translated rapidly into changes at the local level.

It is this difference that gives the Local Government sector its 'canary in the mine' role when it comes to understanding what a transition to a low carbon economy across a sector might actually look and feel like in practice. The next section outlines the approach

of the research that was particularly concerned with working with the human dimension of this sociotechnical transition in specific and general terms.

Learning History Research at the Institutional Level

In this research, the narrative-based action research approach called Learning History has been taken from its traditionally single-project focus and has been developed to work across an institutional field (DiMaggio and Powell 1983). The resulting approach which is particularly concerned with accelerating learning across organisations is termed 'Learning History in an open system (Gearty 2009). Researchers at MIT's Society for Organizational Learning Roth & Kleiner spearheaded the Learning History approach at a large US Auto manufacturer with a view to spreading learning from a highly performing team to the rest of the organisation (Roth and Kleiner 1998). Since then it has been used in a number of different educational and organisational settings including at the Swedish NGO 'The Natural Step' (Bradbury 2001) and as a means of exploring the relationships between the oil giant Shell and the environmental NGO Living Earth (Shah 2001). Predominantly Learning History has been used with a view to increasing the performance and learning of the team and/or organisation(s) involved. This research represents an exciting new avenue for Learning History as it is exploring for the first time its potential at system's level and it is to the author's knowledge the first time it has been used in the Local Government sector.

Crucially, as the name suggests, a Learning History is a story-based approach that draws on the tradition of oral history. By including the messiness of human endeavour, the potential for learning from others' experiences and contexts is retained. Thus the logic of 'visionary' change with all the complexity of chance, swerving intentions and particularity can be explored through the accounts (Gearty 2008). Roth and Kleiner suggested that the potential for learning in any situation is increased if one has access to the '*thinking, experimentation and arguments of those who have encountered the same situation*' (Roth and Kleiner 1998). They proposed Learning History as a way of getting beyond distilled best practice guides that imply change as a linear sequence of carefully executed cause and effect.

In the course of the research I have worked closely with people from the five featured low-carbon breakthrough projects to create single Learning Histories. In interview I have drawn out their experience of the project, not just the execution of it, but the highs and lows, moments of doubt, triumph and revelation. I then annotate the resulting transcripts noting recurrent themes and adding researcher reflections. A narrative thread is then crafted from what the interviewees have described. Together then we have charted a 'jointly told tale' of the project (Van Maanen 1998). The written Learning History that results is then an artefact that results from a richer process of reflection and learning. This resultant artefact is a narrative that describes the project not as an abstracted listing of best practice but through the voices and experiences of the people involved. It highlights themes of interest. It includes researcher reflections and links to theory. In this way it hones in on the human dimension of what it is like to innovate.

As an action research project the importance of leaving learning and knowledge in the field in which it has engaged is on a par with any theoretical insights that might be drawn (Reason and Bradbury 2006). As such the primary purpose of this research has been to facilitate learning for those involved as well as to accelerate learning across the institutional field. Using participative action research, people from across local government have been drawn into collaborative settings to discuss and learn together from the five featured Learning Histories. However a secondary important result of this research, and the subject of this paper, is the analytical aspect of it that makes theorisation possible.

Learning History experts Bradbury and Roth write that a Learning Historian needs to move between the three different orientations of the mythic, the pragmatic and the research (Roth and Kleiner 1998; Roth and Bradbury 2008). They describe the need to explicitly switch from the "*dispassionate stance and in-depth knowledge of a research oriented behavioural scientist*" who draws out analytical themes from the data, to the engaged and immersed storyteller who crafts the jointly told tale from it, and on finally to the pragmatic "*master teacher…*" who is tasked to communicate in a succinct way the lessons that have been learnt (p.356). They liken the analytical step of thematic distillation in Learning History to a form of standard qualitative data analysis akin to the development of 'grounded theory' (p.355) as first 'discovered' by Glaser and Strauss in 1967 (Glaser and Strauss 1967).

Learning History reaches out then to standard qualitative approaches from which general theory can be built. As I worked through the individual histories themes recurred and started to aggregate. That these have a universal ring to them suggests paradoxically that from unique and situated narratives come general themes that can be more widely applicable. In the next section I will briefly summarise these.

Qualities that represent the human dimension of innovation

The following six qualities recurred through the human narratives of low-carbon projects. There were others – what is offered is an incomplete – but nonetheless resonant picture of what characterised projects that had successfully challenged the normal way of doing things.

(1) Working flexible with Risk

Each Learning History involved risks of different types (e.g. technological, financial, reputational, psychological), but in each case risk was embraced as part of the project rather than existing outside of it. The individuals and groups involved worked flexibly with risk to bring it to an acceptable level by moving it, sharing it or simply facing into it.

(2) Champions & Coalitions

Each Learning History involved champions and coalitions and the relationship between the two was complex and significant. The champion role was flexible and filled at different times by those kinds of political, social or expert capital. The coalitions were fluid, self-creating and unconfined by organisational boundaries.

They were often held together by meaningful human relationships of friendship and respect.

(3) Knowledge & Translation

Domain spanning knowledge was achieved in each project. The requisite expertise to make the project a success was drawn from across different knowledge domains such as technology, finance, policy and so on. The appropriate expertise was brought into the project in acts of translation that occurred either individually or between coalition members whose relational skills were sufficient to bring two or more expert domains together.

(4) Reward and Recognition

Each Learning History referred to how the projects were rewarded and recognised. External systems of reward usually kicked in later in the project as others were attracted by the success of the project and it was recognised officially for its achievements. Pre-dating any external recognition, those involved in the projects felt rewarded by the success of the project itself: the experience of joint endeavour it required and its connection to a broader meaningful agenda.

(5) Capacity Building against unknown agendas

Breakthrough projects result from capacity that has been built over time against multiple and changing agendas. By the term capacity I mean the capability to act and respond appropriately to an issue where the issue itself can change. In all but one learning history, a period of capacity building stretching back to the 80s laid the foundation for the innovations described today. And the agenda against which this capacity started to be built was different from today's agendas

(6) Chance

All the Learning Histories identified chance happenings that influenced the direction of subsequent events. Though these happenings did occur by chance, the potential for something happening had been increased by the vision and determination of individuals involved. So the chance, or in some cases the luck did not stand in isolation. It was made.

Relating this research to current sociotechnical theory.

The approach of this research with its focus on the human experience of breakthrough and transition offers a valuable complement to the necessarily abstracted descriptions of current sociotechnical models of system's innovation. With the multi-level transition model, what is won in integration is lost in differentiation. Frank Geels is quick to admit this. This 'outside in' approach needs to be complemented with an:

> actor-oriented approach working from the 'inside out'. Such an approach would look at how actors try to navigate transitions, how they develop visions and adapt them through searching and learning

(Geels 2004 p.43)

It is responding to this call that I would place the theory I have been developing. In their 2007 paper Geels and Schot respond to critiques of functionalism in the multi-level model by drawing on Giddens' theories of structuration to place the actor within it (Giddens 1984; Geels and Schot 2007). Such actors, though they are not the rational automata implied by much of economic theory, are nonetheless faceless and their agency is theoretical. The learning histories introduce the human faces of some of the actors involved in projects of transition. Through the stories we can follow their vision and their processes of searching and learning. By following the research orientation of Learning History research, theme building has drawn out some actor-centric qualities that characterize these projects. The resulting analysis communicates then about agency in a practical rather than in a theoretical way. And what results is indeed largely complementary to Geels' perspective. The above 'inside out' analysis suggests that, far from being strategically or policy driven, breakthrough projects erupt dynamically when contextual factors interact favourably with capable coalitions. This fits well with the 'outside in' conceptualization of transition as an evolutionary process of variation, selection and adoption rather than as a controlled, strategic process.

However my 'inside out' analysis also refutes some of the sharper edges of Geels' idealized model. One edge it refutes is the distinction between niche, regime and landscape. Breakthrough projects in this research are realized by capable coalitions who exhibit complex qualities that include: actors' attitudes to risk, the flow of knowledge and trust; the ability to build capacity against shifting agendas and the ability to self-motivate and draw reward from the system in novel ways. Such an analysis suggests that breakthrough projects do not sit in the niche incubating until they are ready. On the contrary they often succeed because of the actors' agility in moving between levels. In the Histories the narrative action sees protagonists moving back and forth between niche, regime and landscape in a series of well-timed but not often controllable events. And in the analysis the thematic insights relate across niche, regime and landscape in a similar fashion. So we might re-draw the model to show more movement between levels. Or we might collapse them altogether. In an extended paper further challenges raised by this 'inside out' research could be described

Overall the Learning History approach at the institutional level offers a means to engage with models of sociotechnical transition in a fresh way. Narratives that hone in on the human experience of transition help to unblock the difficulty in relating this soaring theory to the practice of the day to day. And from these tales come themes too that can be fed back into this theory to challenge it, to colour it and to enhance our much needed understanding of what a transition to a sustainable future might look, feel and be like.

Bibliography

Anderson, P. and M. L. Tushman (1990). "Technological Discontinuities and Dominant Designs: A Cyclical Model of Technological Change." Administrative Science Quarterly **35**(4): 604-633.

Bradbury, H. (2001). Learning with the Natural Step: Action Research to Promote Conversations for Sustainable Development. Handbook of Action Research. P. Reason and H. Bradbury. London, Sage Publications.

DiMaggio, P. J. and W. W. Powell (1983). "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields." American Sociological Review **48**(2): 147-160.

Foxon, T., G. Hammond, et al. (2008). Transition Pathways for a Low Carbon Energy System in the Uk: Assessing the Compatibility of Large-Scale and Small-Scale Options. 7th BIEE Academic Conference. St John's Conference, Oxford.

Gearty, M. (2008). "Achieving Carbon Reduction: Learning from Stories of Vision, Chance and Determination." The Journal of Corporate Citizenship **Summer**(30): 81-94.

Gearty, M. (2009). Exploring Carbon Reduction through Tales of Vision, Chance and Determination: Developing Learning Histories in an Inter-Organisational Context. Centre for Action Research in Professional Practice, School of Management. Bath, University of Bath. **Doctor of Philosophy**.

Geels, F. W. (2002). Understanding the Dynamics of Technological Transitions. Enschede, Twente University Press.

Geels, F. W. (2004). Understanding System Innovations: A Critical Literature Review and a Conceptual Synthesis. System Innovation and the Transition to Sustainability. B. Elzen, F. W. Geels and K. Green, Edward Elgar Publishing Inc**:** p19-47.

Geels, F. W. (2005). "The Dynamics of Transitions in Socio-Technical Systems: A Multi-Level Analysis of the Transition Pathway from Horse-Drawn Carriages to Automobiles (1860–1930)." Technology Analysis & Strategic Management **17**(4): 445-476.

Geels, F. W. and J. Schot (2007). "Typology of Sociotechnical Transition Pathways." Research Policy **36**(3): 399-417.

Giddens, A. (1984). The Constitution of Society : Outline of the Theory of Structuration, Polity.

Glaser, B. and A. Strauss (1967). The Discovery of Grounded Theory, Aldine de Gruyter New York.

Kemp, R. (1994). "Technology and the Transition to Environmental Sustainability. The Problem of Technological Regime Shifts." Futures **26**(10): 1023-46.

Kemp, R. and L. Soete (1992). "The Greening of Technological Progress." Futures **24**(5): 437-457.

Nelson, R. R. and S. G. Winter (1982). An Evolutionary Theory of Economic Change. Cambridge, Cambridge University Press.

Raven, R. and G. Verbong (2004). "Ruling out Innovations - Technology Regimes, Rules and Failures: The Case of Heat Pump Power Generation and Bio-Gas Production in the Netherlands." Innovation: management, policy and practice **6**(2).

Rayner, S. and E. L. Malone (1998). What Have We Learned? Columbus, Battelle Press

Reason, P. and H. Bradbury (2006). Preface. Handbook of Action Research. P. Reason and H. Bradbury. London, Sage Publications.

Rip, A. and R. Kemp (1998). Chapter 6: Technological Change. Human Choice and Climate Change. S. Rayner, and Malone, E. L. Columbus, Battelle Press **2**.

Rogers, E. (1962). The Diffusion of Innovations, Free Press.

Roth, G. and H. Bradbury (2008). Learning History: An Action Research Practice in Support of Actionable Learning. Handbook of Action Research. P. Reason and H. Bradbury. London, Sage.

Roth, G. and A. Kleiner (1998). "Developing Organizational Memory through Learning Histories." Organizational Dynamics **27**(2): 43-60.

Rotmans, J., R. Kemp, et al. (2001). "More Evolution Than Revolution." Foresight - The Journal of Future Studies, Strategic Thinking and Policy **3**(3): 15-31.

Shah, R. (2001). Relational Praxis in Transition Towards Sustainability: Business-Ngo Collaboration and Participatory Action Research. School of Management. Bath, University of Bath. **PhD**.

Smith, A., A. Stirling, et al. (2005). "The Governance of Sustainable Socio-Technical Transitions." Research Policy **34**(10): 1491-1510.

Van Maanen, J. (1998). Tales of the Field. Chicago, University of Chicago Press.