Changing the Rules? Regimes, Niches and the Transition to Microgeneration

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Abstract

The paper reports on a preliminary, exploratory study of barriers to and strategies for increasing uptake of microgeneration technologies in the UK. The study comprises interviews with 12 respondents equally divided between those working in: (a). mainstream organisations in which microgeneration or renewable energy forms a minor part of their activities; and (b). organisations in which microgeneration is the primary focus of their activity, be it advice about installing it, or technology development thereof. The paper analyses the role of regulative, normative and cognitive rules in maintaining the prevailing system of carbon, national grid based electricity generation. Its conclusions inform sector-specific policy-making about processes and factors that may increase uptake, and deepen academic understanding of factors affecting transition to sustainable energy generation.
1. Introduction

There is great concern about climate change and how to achieve UK and local targets for reducing carbon dioxide emissions. Much attention has been paid to microgeneration technologies for enabling low carbon energy generation. However, uptake remains low. This paper seeks to inform sector-specific policy-making about processes and factors that will increase uptake, and to deepen academic understanding of factors affecting transition to sustainable energy generation. It reports on a preliminary, exploratory study based on the collection of primary data, of the role of rules in shaping views about the ‘proper’ organisation of energy (e.g. electricity) generation, the prospects for transforming arrangements for this, and actions required make sustainable microgeneration ‘normal’.

It takes in analysis of the source of reactions of firms within the incumbent ‘high carbon’ socio-technical system to innovation external to the existing regime. It also embraces analysis of connections among rules and actions taken by niche innovators outside the prevailing system, and the implications thereof for ‘mainstreaming’ microgeneration, where such action entails opposition to or coupling with incumbent firms, technologies and practices. The paper is organised as follows. The next section reviews previous literature related to the barriers impinging on the uptake of microgeneration technologies in the UK, and to understanding how transformations of technology in society occur. Subsequently, the third section of paper presents the findings of the study, focusing on the role of various kinds of rules in enabling or inhibiting transformation. Finally, the conclusion sums up the work of the paper and outlines the broader significance thereof for understanding and managing technological change in society.

2. Review of previous literature

The paper draws upon and seeks to inform work in three main areas: (a). studies of barriers to uptake of microgeneration; (b). transition theory; and (c). strategic niche management. The fundamental motivation for the current project is to develop theory and practice in the fields of innovation management and technology policy. In these areas there has been research on factors promoting or
inhibiting the entrenchment of new or renewable energy in society. For example the ESRC’s Sustainable Technologies Programme (STP) (2002-2006) aimed in part ‘to identify and explain the social and economic forces that shape, foster or inhibit sustainable technologies’. Findings from projects within the STP suggest that a number of factors inhibit the diffusion of ‘microgeneration’ technologies such as micro-combined heat and power, solar photovoltaics, and micro-wind (Sauter and Watson, 2007; Watson et al, 2006). These include excessive payback times and high costs, technical risks, regulatory (e.g. planning permission related) obstacles, and lack of reliable advice on installing the new technology. Watson et al (2006) compared the economics of three microgeneration technologies considered to be commercially available, or near-to-market. They were: solar photovoltaic panels (generation output data calculated on the basis of an existing social housing field trial in Havant, near Portsmouth), micro-CHP (based on running computer models, with scenarios of a 2-bedroom bungalow and that of a 4-bedroom detached house) and micro-wind (based on computer modelling data, assuming a 1.5kw turbine, installed 7 metres above the ground, in a range of urban and rural locations). The shortest payback period, of between 2-9 years or 7-19 years was for micro-CHP systems and rose inversely with the level of heat demanded. The longest payback period was between 35-48 years for the photovoltaic system, whilst the payback period for micro-wind ranged from 7-19 years depending on the location in which it was installed (though the calculations are not reliable due to uncertainty about factors such as the level of operating and maintenance costs for each technology). Meanwhile community-level efforts are argued to be limited by a lack of deliberate niche-wide or bottom-up learning processes (Walker et al, 2007). Moreover, such initiatives don’t take off or fail owing to the complexity and novelty of funding, local installation difficulties, lack of prevailing social cohesion, and ongoing operational requirements, rather than the novelty of the technology involved (Monaghan and Steward, 2006), or when they are positioned as diametrically opposed to the mainstream (Smith, 2005).
The findings from academic research about barriers to uptake of microgeneration technologies are broadly in line with conclusions from a report by the (then) Department of Trade and Industry (DTI). There, barriers to ‘distributed’ generation are cited as: cost; lack of reliable information; the existing network structure; and regulatory issues (DTI, 2006; 2007). In addition, an earlier report for the DTI (2005) identified barriers to uptake of ‘microgeneration’ technologies as pertaining to the following areas: legislation/planning, including problems with planning permission, ‘expensive metering’, and a lack of targets and incentives for the adoption of renewable heat; the high cost of technology; and a low level of consumer awareness of microgeneration technologies.

Remedies for the above are suggested as making required changes in the planning system, attending to the provision of appropriate grant schemes to encourage development and adoption, and the establishment of coordinated, central programmes to increase the amount and quality of information and advice to installers and consumers of the product of microgeneration technologies.

A different yet complementary set of insights could be produced by considering institutional factors connected with the emergence of a new industry, in the context of understanding what enables or inhibits microgeneration, or at any rate the embedding of low carbon and renewable energy technology in the UK. The paper is thus informed by previous work in transition theory (Elzen and Green, 2004; Geels, 2002; Geels and Kemp, 2007; Geels and Schot, 2007; Smith et al, 2005; c.f. Dosi, 1982; Kemp et al, 1998; Nelson and Winter, 1977; Rip and Kemp, 1982). The paper extends past work offering a critique and revision of transitions theory and deepening our understanding of the interrelation of technology and society (Genus, 2008; Genus and Coles, 2005; Genus and Coles, 2007; Genus and Coles, in press; Genus and Nor, 2007). Also, it is informed by research which seeks to incorporate insights from institutional theory into analysis of long-term socio-technological change (e.g. Geels, 2004; Geels and Kemp, 2007). Fundamental to transition theory is a multi-level perspective (MLP) for analysing technological transitions in which the ‘meso-level’ represents the
prevailing socio-technical regimes, said to represent different social groups each shaping ideas and actions about the necessity for, and feasibility of, new technologies. These concur within and across regimes in relatively stable socio-technical systems but may fragment under macro-level ‘landscape’ pressures, such as increased awareness of the need for environmentally sustainable energy, or under challenge from innovation in micro-level ‘niches’, which ultimately may replace existing arrangements. Ideas about and actions in socio-technical regimes are shaped by, and shape, normative, regulative and cognitive rules (Geels, 2004; c.f. Aldrich and Fiol, 1994; Scott, 1995; Garud et al, 2007). Despite the theoretical appeal to institutional rules, transition theory has not analysed systematically or on the basis of primary data the role of rules in socio-technical regimes, and the implications thereof for constructing pathways to sustainable energy generation.

The significance of ‘rules’ employed or created by different types of actor, may be conceived of in terms of how, for example, they shape and are shaped by views about the benefits of microgeneration, its feasibility within or outside a national ‘grid’ distribution system, and the ‘rightness’ of a ‘winners’ versus ‘portfolio’ approach to assessing and continuing to invest in a range of options for microgeneration. More specifically, regulative rules are characteristically found in legislation, regulations, programmes and technical standards which govern design, production, and innovation of technology (in this case within the incumbent energy generation system and microgeneration technologies). In contrast normative rules pertain to what actors see as the norms, responsibilities and obligations which need to be heeded or performed in energy generation, and which might enable or constrain development and uptake of microgeneration. This includes questions about the ‘rightness’ of policy goals promoting microgeneration, and the proper role and conduct of industry, government, and consumers/users in maintaining existing systems for energy generation (or in the case of the present paper co-constructing a new one based on microgeneration). Finally, cognitive rules are connected, for example, with assumptions and beliefs about the effectiveness of policy instruments, guiding principles, and the benefits of technology (i.e. microgeneration) for society. Guiding
principles may concern in this case the heuristics underpinning the assessment of microgeneration technologies by incumbent and niche actors.

Methodologically, the study is more concerned to deepen and enrich insight into the phenomena at hand than with issues of generalisation and causation. It thus employs exploratory, qualitative and case study approaches, blending a deductive MLP-led approach to identifying relevant factors and actors to probe with an inductive approach emphasising the contexts, concerns and activities of subjects as expressed in their own terms. North East England was selected as the site for a primary case study of uptake of microgeneration owing to issues related to the cost-effectiveness of the research, the availability of a number of relevant research sites and subjects and their proximity to the lead author. Funded by Newcastle University Business School the study consisted of 1-2 hour taped interviews with 12 people, working within energy sector organisations in which involvement with microgeneration technology development or uptake was either: (a). a major part of their activities, or (b). a minor part of their activities. Data was collected on individual beliefs and assumptions about microgeneration, and from niche and incumbent regime protagonists regarding visions of energy generation and the actions required or feasible to effect transformation thereof, and the extent to which these are underpinned by shared regulative, normative and cognitive rules. Interviewees were selected on the basis of a purposive sample and ‘snowballing’. The collection of primary and secondary data on the policy, economic, market, cultural and technical context of energy generation in the UK enabled exploratory analysis of a putative system transition. The main findings are presented below.

3. Findings

3.1 The role of rules in lock-in of the prevailing UK system of energy generation

Interviewees made reference to a range of factors which seems to ‘lock-in’ the prevailing system of energy generation and deter mainstream firms from investing in distributed energy or
microgeneration technologies. The key words mentioned by them include high cost and risk, problems with planning permission, public indifference and opposition, unavailability of products, infrastructural incompatibility and reliability of equipment, unavailability of good advice; lack of qualified installation personnel and certification of trades people. These may usefully be reconceived in terms of regulative, normative and cognitive rules adherence to which, it is suggested, hold the incumbent socio-technical system in place.

Regulative rules

Regulatory rules contributing to stability include those connected with public subsidies or national policy targets which militate against investment in new systems. Here, interestingly enough, the view was expressed that national targets, such as those set for the reduction of total greenhouse and specific carbon emissions or for increasing the proportion of energy or electricity generated or consumed, were ‘very high and probably unobtainable’. However these ‘stringent’ targets were considered to ‘pull’ development and adoption that otherwise would not have occurred. As one interviewee said:

‘… [targets have led to]…subsidy schemes which have encouraged renewable generation. The renewables obligation scheme, for example, was introduced to try and induce more renewable projects to help move closer to the target. If we didn’t have targets…I doubt whether we would have any renewable obligation…we would probably have no particular interest in renewables quite honestly. (I5 - senior manager, energy project management consultancy Co.).

Yet interviewees pointed to the lack of supportive policies to encourage the switch to low carbon energy technology, saying that only ‘huge increases in the cost of gas or oil or coal’, or ‘fire brigade action’ by government in relation to carbon emission reduction will transform the situation (I5 senior manager, energy project management consultancy Co.). This ‘situation’ may be understood in terms
of its relevance to how those in mainstream energy firms conceive of the business they are, or should be, in, as discussed in the following sub-section on normative rules.

**Normative rules**

Aspects of the planning system gave cause for concern and surfaced in references made by interviewees working in mainstream energy organisations to the ‘parish pump politics’ and ‘irrational opposition’, which prevent schemes which are ‘sound commercially, technically and environmentally’ (I5 - senior manager, energy project management consultancy Co.). The same informant talked of cases in which officers at a UK local authority had recommended planning approval for local wind farms but where elected councillors, under pressure from some prominent members of the electorate, rejected schemes for what otherwise were technically sound projects.

It was observed that making the transition to distributed or microgeneration would have been easier for central government under the arrangements governing electricity generation, transmission and distribution prior to privatisation of the sector in 1989. As one interviewee commented:

‘[W]e’re in a difficult situation, it would have been much easier pre-1989 when the industry was state owned for a government to say ‘this is a policy decision, that is what we’re going to do’. Now they’ve got to try and induce the private companies which are global companies EDF, RWE…we’ve got Spanish companies coming in now, to invest in the UK. Well, why [should they] when they can get a better return by investing somewhere else on something different. So it’s got to be a really, really strong case to persuade a private sector company with shareholders to account to…’ (I5)

What is more, sector characteristics are argued to militate against ‘step change’:

‘[T]he value of the assets in the industry, you know it is megalithic in its proportion compared with other industries. So to achieve any step change technically you’re going to have to ship
trillions, you’re talking about trillions, you know. How do we impose a step change, how do we take advantage of the step change on an industry whose asset base is trillions big? It’s not like say, what could we say, the railways or something like that, or even part of the railways where you’ve got competitive advantage if you run a faster service or a better service or whatever, or develop some new transport system, jet aircraft compared with propeller aircraft. The investment there is manageable, it’s accommodatable, but to introduce a step change of that sort in the electricity industry means replacing trillions of pounds, dollars worth of assets with something different. You can do that in transport, in other fields, but not so in electricity, not with any ease anyway.’ (I5 - senior manager, energy project management consultancy Co.).

In relation to future industry development the role of bigger companies entering or taking a larger interest in microgeneration is seen as important, as are the strategies employed by retailers. For example, one interviewee said:

‘You are getting companies like Scottish and Southern, for example, that are trying to break away from competing by selling electrons on price, to having a different kind of service relationship with the customer. So if you have a leasing deal, where you lease some domestic renewables, from - it is only an example - Scottish and Southern (British Gas are doing similar things) then you still have this twenty-eight-day rule where you can still change your electricity supplier. But if you had a relationship with them where you are leasing micro generation units, you are less likely to do that. So they see it as a way of having a closer relationship. And it is the big companies like that, that are starting to get involved, that will help to turn the industry around. Otherwise, it is mostly mom and pop organisations. I met the Energy Manager of B&Q about a year ago, a bit over a year, and they will looking at putting wind turbines into their stores but one of the barriers then was their policy is that every store
carries every product. They have 350 stores, they couldn't find a wind turbine manufacturer to
give them 350 turbines. That is how early in the take-up the industry is. Now if you have big
companies like, again, if it was a British Gas turbine or a Shell or a BP, a name you recognise,
a big company, they would have the clout to make sure it works and give it the technical
support needed and to market it. One of the units we have on our roof is prototype number
three from a manufacturer. Interestingly enough, bearing the comment about privatisation
quoted previously, this informant noted that ‘one of the factors that is helping, actually, is with
the de-regulation of electricity generation and supply’. (I3 - technical director, Renewable
Energy Testing Co.).

Cognitive rules

Discussions of risk and its appraisal revolved around the nature and role of rules employed by
interviewees in relation to the evaluation of energy technology options and projects, and also the
efficacy of energy efficiency measures. Some interviewees commented on the conventional rules of
thumb used in practice. Hence one person commented on their own company’s use of a ‘bible of
reference data’ to analyse ‘which is the best renewable technology to apply in a particular place to
serve a particular purpose. We would run the ruler over all of the technologies, rank them and say
[which] is the most cost effective.’ (I5 - senior manager, energy project management consultancy
Co.). Others commented on the relation of risk appraisal criteria to the motivation of large-scale
corporations to invest in renewable energy technology development. Perhaps unsurprisingly, this was
argued to be linked to the potential of large-scale projects to perform in such a manner as to generate
economic returns to satisfy their shareholders. What is of interest here are the conventions or rules
that arise and become accepted as wisdom, such as the notion of an acceptable rate of return (of 15%) on
‘normal’ electricity projects, whereas marine technology projects might require ‘multiples of that’
to cover for the risk involved, whilst wind energy projects may not require a large risk premium
above the standard 15% rate of return. Another informant expressed his implicit understanding of the
pecking order of available options beginning as follows: ‘the easy stuff, [the] low fruit are cavity wall insulation, roof insulation, double glazing. The payback on those is much shorter than any renewable you put in’ (I3 - technical director, Renewable Energy Testing Co.).

In a similar vein one interviewee felt that there were certain ‘natural ways of doing things’ (e.g. based on the national grid) and that there was ‘not much hope of bottom-up actions changing anything’ (I5 senior manager, energy project management consultancy Co.). The ‘naturalness’ of certain beliefs owes something to the credence accorded to stories shared within a sector or technical community. For example one interviewee related a possibly apocryphal story, about the role of ‘planners’ in a certain UK city council in the adoption of a no wind farms policy. It, the interviewee had been told, had rejected schemes involving wind turbines because the turbines were too noisy, even though in some cases the manufacturer had submitted what should have been acceptable noise data.

In addition, there was the issue of metering. As one person observed: ‘the B&Q [wind turbine] plugs into the house, plugs into the wall on the domestic side of the meter. So there is no capability there for selling any surplus back. If you are generating more than you need, then it just dumps it.’ (I3 - technical director – Renewable Energy Testing Co.).

On the subject of reliability and off-grid supply the view was expressed that:
‘A non-grid supply for example, to an isolated community will almost certainly and I say this from my professional experience and knowledge, almost certainly experience a less secure supply of electricity than one obtains through the sockets on the floor in this building, shall we say…So generally speaking to ensure a reliable supply one needs the public supply which one could use as a back-up supply, in other words to fall back upon if the community generation fails, or just have to accommodate the fact that at times you can’t run your television, your computer, your hairdryer or whatever, because your wind turbine is not operating because there’s no wind, or its at night and
there’s no sun shining on the schemes. So that’s the negative side, it’s got cost implications and security of supply implications.’ (I5 - senior manager, energy project management consultancy Co.).

Most interviewees talked about the ‘perversity’ of investment appraisal methods such as payback period, internal rate of return and discounted cash flow. There was a difference in the way the discussion flowed. Some expressed a concern for how, say, wind farm projects with a twenty-year lifetime were treated more favourably (in DCF terms) than more productive hydro electric schemes producing more than three times the energy over seventy years.

Interviewees centred on the incompatibility and reliability of equipment. Time and again reference was made to problems associated with connections to the national grid. A typical view amongst interviewees was that:

‘The small generators which are being promoted at the present time do not lend themselves to connection to the existing distribution system so huge investment will be required by somebody to make that distribution system compatible with the small generations which are being proposed for community schemes. And nobody seems to be anxious to pick up the cost of doing that.’

In terms of the process by which transition might take place one other comment appears apposite. This concerns the idea of the UK government being a critical player ‘stuck in the middle’ between environmental campaign groups, on one hand, and industry lobby organisations such as the CBI, on the other. As one person put it in relation to emissions trading and carbon pricing policy:

‘The Government are walking a tightrope currently on the whole question of emissions trading and carbon pricing because…to force people to emit less carbon they can increase the price,
apply a carbon tax to put it simply. But, of course, that applies to industry as well and the energy intensive industries [would] go to the wall if that was done. So the Government on the one hand have got the greens pushing them one way, they’ve got the CBI pushing them the other way, and it’s finding the medium route which is the difficult, the political trick which they’re struggling with. They [the current UK Government] are getting by but I don’t think we’re seeing much by way of change.’ (I5 - senior manager, energy project management consultancy Co.).

A different perspective was provided by one person who thought in terms of the effect on domestic uptake of renewable energy technology ‘if [by doing so that] affected house prices. If it was difficult to sell a house because it didn't have micro-renewables on. If they just didn't move in the market because they didn't have any that is a good indicator.’ (I3 - technical director, Renewable Energy Testing Co.).

A number of those interviewed put forward ideas for improving aspects of infrastructure. Some referred to the fundamental need to attend to the inefficiency of the national grid by strengthening transmission lines, regardless of the integration of renewables into the system. Others discussed the need for quality control of voltages and frequencies across domestic generation and the grid (low voltages operate at the sub-station-dwelling level, whilst higher voltages apply at national, regional levels of transmission and distribution). There was much discussion of metering issues – for example the introduction of two-way meters capable of facilitating the sale of electricity back to the grid by domestic and other small-scale generators (though it was recognised that in general power companies are not receptive currently to new approaches to metering).

The discussion was taken in another direction by one informant who proposed the idea of development of the energy equivalent of an ‘integrated hi-fi amplifier’, a device capable of accepting
power from different renewable energy sources. One further point to be mentioned concerned the issue of accreditation. Here, one interviewee felt that the accreditation ‘cliques’ referred to in the previous section would be opened up ‘when the big boys come in’, meaning large energy firms which would bring in new ‘rules of the game’, though how this would happen was not specified.

Reference was made by several interviewees to various ‘secondary and tertiary’ issues which would need to be recognised and remedied if distributed generation, microgeneration and community renewable energy were to developed significantly. These included the need for many more trained engineers, ‘we’re going to need an army of people’, and there may be a need ‘to import huge labour resources from abroad’, and also import materials, with possible adverse consequences for the UK balance of payments. (I5 senior manager, energy project management consultancy Co.).

3.2 Changing the rules: problems and practices

Regulative rules

Interviewees from ‘niche’ organisation unanimously pointed to the rapidity with which grants available under the UK low carbon buildings programme ran out (in February, 2007 and again in March, 2007) and the implications of such on future investment decisions made by households and communities, as well as on their perception of the seriousness of governmental policy in tackling climate change and greenhouse gas emissions.

In terms of standards interviewees pointed to various UK and EU and other standards which assure the technical quality of products and installations services. They referred to the role of accrediting bodies and programmes, such as the Building Research Establishment’s role in creating lists of accredited equipment installers (on behalf of the then DTI), from which consumers would have to choose if they wished to remain eligible for certain government grants. One person referred to this as an example of how certain agencies or firms linked to government controlled the ‘rules of the game’.
The same interviewee felt strongly that such processes could serve to exclude innovative firms, that is:

‘Anyone who doesn’t want to pay money to join a membership. In other words, if you want to become a member of the Solar Trade Association, membership is not upon product suitability, on your company’s capability or abilities to do stuff. It’s about price. If you pay you become a member. If you want your product that you bring in from China accredited under the low carbon building programme, you pay a huge fee to a single organisation called the Building Research Establishment, [which] gets huge sums of money from the DTI. And they control the rules. So if I don’t want to spend all of that money because I’ve [attained] international standards …, which are applicable around the world, but you want to add a new level, a new layer of accreditation, that has no technical basis, other than you’ve paid me a lot of money and I’ve said ‘yes, here’s a certificate’… [On] the basis of that you can now give away taxpayers money. What is that then? (I2 - - energy efficiency adviser).

Normative rules

There was mention of the problem faced by small and/or community organisations of raising finance, or perhaps of seeing fund-raising as something they ought to be able to do. With regard to community enterprises particular mention was made of the issue of finding a suitable ownership and operational business model. Moreover, many communities are not conversant with fund-raising, a lack confidence which may be amplified if they are also unsure about whether or when they will get a return on their investment.

There was a great deal of uncertainty about the proper role of government in enabling transition, though there was more commonality regarding role of community climate champions in effecting change. Interviewees’ remarks drew contrasting portraits of the process by which transition could or
ought to occur – be it ‘top down’, ‘bottom up’ or something else. (Some informants seemed to hold internally conflicting views in which both top-down and bottom-up visions were strongly advanced at different points in the interview.) A ‘top-down’ vision of transition was expressed by a number of interviewees, one of which stated that there is a need for ‘a bit of push’ from the state down (I12 - project director, carbon reduction and awareness Co.). On this view the government is seen as ‘absolutely crucial’ in setting the scene economically and fiscally, and that that has to happen before it can start communicating (with the public). This would include the provision of grants and subsidies to encourage domestic, community and other adoption of renewables/ microgeneration technologies, and carbon offsetting or emissions trading schemes. Moreover national and local government action can potentially promote awareness of climate change and the need to reduce carbon emissions, through actions to develop and make visible success with ‘eco-towns’ or energy efficiency in specific localities (developments in Woking and London were frequently mentioned by almost all interviewees in this regard). Other remarks in this vein referred to the need for someone with the ‘wisdom of Solomon’ who could take ‘an overarching view’ of energy needs and means to effect the required transition ‘top-down’ (I9 – renewable energy adviser).

Some pessimistic views were expressed regarding the ability of prevailing government approaches to realising visions of low carbon energy generation and use. For example, one interviewee stated that fundamentally, to rectify the situation regarding the mitigation of climate change ‘either we will take the strategic incremental steps necessary or we will have cataclysm and catastrophe, but one way or another it will happen; nature will force it upon us’. (I6 – community renewable energy support Co.). A sceptical vision was also expressed in the words of one participant for whom success will have been achieved ‘when we finally get rid of [the concept] of micro[generation]. Micro is window dressing; we’ve got to be big on this one (meaning that policy and other activities should focus at city scale, rather than household or district level improvement’ (I2 – adviser to public, energy efficiency advice Co.). Perhaps an intermediate view is one in which the future ‘doesn’t look very exciting’,
amounting to ‘a building with an efficient boiler in it, and a new grid system which has to be buried underground. [However] carbon emissions would be a lot lower [based on] space heating electricity [and] people, I think, would have a better understanding of where their energy came from.’ (I12 – project director, carbon reduction and awareness Co.).

A different perspective was provided by several interviewees who could be said to envision the transition process as driven both by top-down as well as bottom up-activity, as well as by the activities of key individuals or champions at critical junctures. On this model the climate change agenda is shaped from ‘above’ by international and national policies informed by scientific advice, whilst the work of NGOs, other climate champions and ‘key privates offer framing of the agenda from ‘below’.

Seven interviewees referred to the fundamental role of ‘climate champions’, whose determination and commitment realised schemes in specific localities which otherwise might have been abandoned – or not got off the ground in the first place. (Some of these interviewees also referred to ‘reverse champions’ whose activities could be harmful). Climate champions could work from the ‘bottom up’ within local communities, or hold positions of influence within, say, policy-making bodies. Examples of climate champions in local geographical communities were given. Several interviewees made reference to Botton, a Camphill Steiner community which set up a social enterprise (or ‘community interest company’) in the North York Moors. As described by one person:

‘Botton is in Danby parish and they’ve been there for years and they’ve been quite inspiring in terms of they’ve built sustainable houses, quite unusual but in keeping with being a National Park and they’re sustainable in terms of energy efficiency and then they have renewable energy technologists, ground source heat pumps, solar hot water panels, wood fired community heating, in particular… and then things like passive solar design and other sort of
kind of things. They were quite inspiring and what is good about Botton is that because these people have been doing it for many years, one of your visits is to that community...people just walk down the road, talk to people who have been doing it for a long time and get inspired to think “well we could do this as well”, just learning from them because they’re still local people who’ve been doing it for a long time...One guy was like “right I’m going to look into small scale wind” because he had an engineering background and so was like “I’ll do this” and he became an expert in that, he separated the good ones from the money makers, as it were, and someone else took ground source heat, someone else looked at solar hot water panels and they each took one, a group of them did.’ (I8 – Consultant, Sustainable Energy Consultancy Co.).

An interesting aspect of the Botton case is the view that much design work is carried out by enthusiastic champions who are ‘tinkerers and fiddlers’, willing to adapt existing equipment so that it works for them. This is illustrated in the following quotation:

‘I do know people who have made their own solar panels and wind turbines and spent time trying to even modify existing technologists because there are some skilled people out there, engineers and stuff who once they’ve learnt a bit about something feel that they can change it...Botton has had...various renewable energy technologies that they’ve bought from manufacturers...in Europe. They’ve bought renewable technologies over there, they put them in and because it’s not worked for their particular situations modified it and got it to work for them. (I8 – Consultant, Sustainable Energy Consultancy Co.).

In a sense these are local community innovators, in a sector (in the UK) which one interviewee felt is not innovative, rather being dominated by ‘opportunistic’ resellers. One of the noteworthy comments made in relation to community generation centred on the need for renewable energy support.
organisations to focus their activities on communities in which the existence of champions was apparent and as one person put it, to be ‘ruthless’ about how much support should be given to communities without champions. This requirement was cast in the light of the limited resources available to support organisations, as well as the feeling that there was a need to move from ‘process’ to ‘output’ with respect to the achievements of community renewable energy generation. Remarks were made by a number of informants regarding processes by which learning and networks are built in a manner facilitative of distributed generation, microgeneration or community energy projects. Interviewees referred directly to the role of links between community groups in ‘spreading the message’ and sharing information which could ‘empower’ such groups by increasing their sense of having expertise in energy matters.

The point was made by several interviewees that this work could be accomplished more effectively if there was, for example, in each local authority, a designated officer with a responsibility to oversee and promote community renewables throughout the area concerned. One person was careful to note that the local authority might not be the right place institutionally for such a post, and that wherever such an officer was to be placed organisationally, the fundamental point was that their role should be about connecting energy issues with the everyday lives that people lead relating to their values, behaviour, and choices. (In the North East local authority climate change officers have been appointed in, for example, Newcastle upon Tyne, Gateshead, Middlesbrough and Sunderland. In 2005 the Government’s Climate Change Communications initiative was launched, part of which was a competition to select young people from around the UK to act as ambassadors to spread awareness of climate change issues in their region during a one-year term of office. The first annual North East climate change ‘champion’ was thus selected in 2006).

Interviewees (from both ‘niche’ and ‘incumbent’ organisations) typically made reference to the same group of champions working for or with local authorities locally or elsewhere in the UK, noting that
locations and specific buildings or devices could champion low carbon living or energy efficiency. Local champions cited were individuals like Allen Creedy, at Newcastle City Council, and Lionel Hehir at Groundwork. The names of Alan Jones and Ken Livingstone and their work in Greater London were frequently mentioned. The town of Woking was cited as exemplary of practice in the field, the city of Bath the reverse. The almost ubiquitous reference to BedZed was made as illustrative of how novel architectural design can ‘champion’ energy efficient building. One of the main issues identified amount champions within local authority settings concerned the degree of authority and responsibility that certain key figures have and the relation of this to leading change. As one interviewee put it (speaking about the work of former Mayor Ken Livingstone in London):

‘Well he [Ken Livingstone] had the authority to set up the London Climate Change Agency and the [London Energy] Partnership and then to bring Allan Jones on board [as CEO of London Climate Change Agency] who’s a recognised practitioner and expert. Once he’s done that, he then starts to tell people about the initiatives that he’s going to introduce, so he’s been careful not to over promise, he’s only been able to then promise people or to show people the way once he had all those framework issues in place, ready to manage to circumvent national policy. So I think it’s getting the right bits of the jigsaw in place is the first critical point and then you could start to educate people about what’s going to happen and show them the ways that they can make the change themselves. So it’s leadership pure and simple.’ (I12 – project director, carbon reduction and awareness Co.).

Interviewees pointed to the work over many years of champions such as academic scientists and NGOs like Friends of the Earth and Greenpeace who continued to ‘bang the drum’ about environmental pollution, conservation and climate change when for some time their concerns were largely being ignored. Interviewees seemed to agree that subsequent to this initial campaigning work
recent years have seen a need for and the greater prevalence of ‘joint movement’, in which ‘it has to be everyone in it together’.

Cognitive rules

There was much discussion of payback period in the interviews with niche actors. A fundamental point raised by one interviewee revolved around the ineffective presentation of sustainability targets in government policy and the ignorance of consumers about basic issues which would affect their ability to assess the worth in cash terms of purchasing, say, a domestic wind turbine system. As one interviewee put it:

‘No one ever gave us the basic education. We know what a half pint is; we know what a pint is. We know what a litre of orange juice looks like; we know what a kilo of sugar looks like. These are things enshrined in our everyday life. To then suddenly introduce a new language of kilowatts and megawatts and carbon and carbon footprints, without telling us what they were, that was the big, big problem. (I2 - energy efficiency adviser)

Others conceived of the issue differently, referring to the narrow range of performance criteria capable of being measured using conventional standard appraisal methods, which were thought to be ill-suited to capturing costs or benefits to environmental well-being in accordance with the very long term horizons associated with a sustainable approach to dealing with climate change. Several interviewees also argued that policy-makers need to ensure that company accounting procedures are based on a ‘triple bottom line’ approach, as ‘the standard default thing’ in which financial, social and environmental costs and benefits are treated symmetrically ‘to reflect externalities of social and environmental harm’. (I4 - community renewable energy support Co). Their view could be summed up as ‘let’s do it now anyway because the actual, the burden on future generations to try and do
something about it then if we don’t do anything about it now, it’s…immoral as well for us to pass on that legacy.’ [I4 - community renewable energy support Co).

Issues were raised by all interviewees (in both niche and incumbent groups), connected with decisions to purchase and the routine use of products associated with microgeneration. There was, for example, an appeal to the ‘critical’ need to reconnect people with their local environment and supply and use of energy in order to realise a sustainable energy system, people who have grown accustomed to appreciating the low price and facility of power on demand but for whom the generation of power and its broader consequences has become rather remote. A fundamental problem was cited by most interviewees as being lack of good advice about microgeneration/ renewable energy technologies in general as well as about specific products and their benefits, costs, and potential problems associated with their use.

Particularly interesting comments were made by one interviewee who is concerned about poor advice given by (and indeed the lack of brand recognition of) bodies such as Energy Savings Trust, which are charged with giving advice to the public about energy efficiency. This informant mentioned examples of poor quality of advice given by staff therein. For example, staff failed to advise people about how energy saving light bulbs work in practice, or appraise them that ‘heat pumps are designed for giving low level heat’ (I2 - energy efficiency adviser). A second issue raised was that of unavailability of product, linked for example to a shortage of large-scale manufacturers capable of supplying nationwide retailers wishing to stock renewable energy equipment for domestic use. Others pointed to the futility of putting green energy production back into an inefficient grid network, and proposed a role for combination technologies which could operate so that their ‘supply curves complement each other so you have a more full, bigger picture, bigger window of generating time’. (I4 - community renewable energy support Co).
Attention was drawn to the risk that consumers would be disappointed if what they bought ‘failed to do what it said on the tin’ and the damage that could be done to the market for microgeneration or domestic technologies by - as one person put it - ‘crap’ developers, retailers or advice. Domestic scale renewable energy equipment would get a bad name, thus affecting perceptions of the feasibility or operational effectiveness of technologies and thus future uptake. This could happen if, for example, wind turbines were installed in the wrong places, both in terms of the wind characteristics of particular geographical locations and in relation to their positioning on the roofs of specific properties. As one interviewee said:

‘…if you put a small wind turbine on a single-brick, lime-mortar wall on a house, the sort of [strong] winds we have been having lately, that wall would come down. You've got to be careful…because the wind turbines carry a load with them [and] when the wind blows, it can shake [the house]. You have to be careful as to how you attach that to the building. If you are putting solar hot water on the roof, you must make sure the roof can take the weight. It is simple stuff like that. The main issue is around wind turbines, and how they get attached. It is not rocket science…but we need to make sure people are aware of how you have to bracket them [wind turbines] and distribute the load so they don't bring a chimney or a wall down. It is not rocket science; we just need to make sure that the cowboys don’t get there.’ [I3 - technical director – Renewable Energy Testing Co.).

Even those working in organisations whose main activity is developing renewable energy technologies struggled to think of how they would go about finding someone who could install devices on their own property. The following quotation illustrates the situation with regard to demand for qualified installation personnel in the UK for some technologies, and also the certification of trades people:
‘If you want to replace your boiler with a CHP unit, for example, if you take a hot water boiler and replace that with another hot water boiler, you need a plumber. You put a CHP unit in, you need an electrician as well. If it is connecting up to the meter, you don't only need an electrician, you need a meter-qualified person and there is only…that's a guild of its own, is that...Unifying the trades…I'm not arguing for them not to be qualified, but…this is a sort of demarcation dispute, almost. You can qualify an engineer to do all those, so that’s a super-plumber, electrician, meter guy combined, just all in one go. Should still be certified, trained, qualified, all of those things, but not three different people to do it, one person to do it.’ (I3 - technical director – Renewable Energy Testing Co.).

4. Conclusion

The preliminary study reported herein highlights various policy-making, regulatory, technical, socio-cultural, cost- and market-related factors inhibitive of the development and commercialisation of microgeneration technologies, which seems to confirm findings elsewhere. What the study offers by way of difference, which future research could investigate further, are findings indicative of the potential of various types of rules, implicated in governmental policies and legislation, industry practices, beliefs about climate change and renewable energy technology, or learning processes, to contribute to the realisation of new visions associated with (sustainable) energy generation. The study finds very different ‘rules’ being employed by or of concern to members of each of the two groups investigated – representatives from ‘incumbent’ energy firms and those from ‘niche’ microgeneration-focused organisations. These were manifest in, for example, differences of view regarding the benefits of microgeneration, its feasibility within or outside a national ‘grid’ distribution system, and the ‘rightness’ of a ‘winners’ versus ‘portfolio’ approach to assessing and continuing to invest in a range of options for microgeneration. Certain findings cut across the distinction between the two focal groups, suggesting limits to the extent of regime- (and rule-based) differences in how those in the fray conceive of the proper role of policy-makers in managing the transition to
sustainability, and the prospects for ‘top-down’ or ‘bottom up’ approaches, for example. The extent to which there even ought to be a policy focus on ‘microgeneration’ seems to be a bone of contention, implicated in the rule system of protagonists from both ‘incumbent’ and ‘niche’ groups.

References


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