

Barnsley

It's a no-brainer!

A Learning history

Issue VWS – Workshop Version

Nr. 3 in a series of learning histories on the subject of “Innovation for Carbon Reduction” in or connected with Local Authorities.

July 2007

A jointly told tale

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Based on the perspectives and recollections of

Dick Bradford

(Barnsley Metropolitan Borough Council)

with added perspectives from:

Robin Ridley (South Yorkshire Forest Partnership)

Document History

A learning history is never complete. Some however are more complete than others. Those conducted early in the series have been read more often, commented upon and in some cases have had perspectives added.

Those later in the series are freshly completed in time for the workshop and have only just finished the first checking stage.

The document history below gives an idea of where in the process this history lies. Though the workshop draws the line under this particular learning history, that should not be mistaken for the 'history' being complete. Much more could be added about each one.

Version	Date	Comments
Draft v1.3	July 2007	First Draft sent to Dick for checking
Draft v1.6	Nov 2007	Updates and amendments
Issue v1.0	Dec 2007	First Issue Anonymised version Sent to 3 rd party RR Sent to active reader 1
Issue v1.1	Feb 2008	Perspective added from RR Minor mods. Clarifications on air quality Updates checked with DB &RR
Issue VWS	Feb 2008	Amendment about EMSystems Photo added Workshop version.

Note on Learning History

What is a Learning History?

This document is written in the style of a Learning History, an action research approach to learning that seeks to bring analysis and story together in a way that has value for those originally involved in the case as well as those seeking to learn from it. The approach was originally developed by researchers, Roth and Kleiner from MIT's Society for Organizational Learning and was further developed by Hilary Bradbury in her doctoral work (Roth and Kleiner 1998; Bradbury 2001). Roth and Kleiner coined the term 'learning history' describing it as a way to get past listing best practice and more into the '*thinking, experimentation and arguments of those who have encountered the situation*' (Roth and Kleiner 1998). The learning history has been used to good effect in many settings in the industrial sector (e.g. at a large US auto manufacturer) and the social sector (e.g. at The Natural Step).

A learning history has, to-date, mostly been applied within one organisation and in the private and NGO sector. By contrast, in this research, learning history is being applied across 5 different organisational settings within Local Government in the UK. The examples being charted are where innovative carbon reduction has taken place. They involve low-carbon technologies in some way. This Learning History then is just one of in a series. The individual histories may be partial – sometimes not fully describing all aspects of the innovation in question. However the totality of the series aims to paint a picture of how innovation for carbon reduction comes about across different contexts. It seeks to present this picture in a way that increases the potential for learning and action.

Differences from a Case Study

A learning history is different to a case study in a number of ways. Firstly, as an account it really tries to get into the individual human story of what happened. It aims to present perspectives on a case rather than synthesizing several accounts into one dominant researched 'truth'. So the ups and downs of individual experience are charted starting with perspectives from just one or two people close to the case. Their accounts are not presented as definitive or authoritative. Naturally there will be gaps on detail; certain events will be emphasised - others maybe not. Over time I hope to balance and enrich that by inviting, comments and stories from other people who were involved in the case (see "Participating Readers" below). This multiple perspective approach is taken in the belief that human stories add accessibility to and demystify the happenings in a way that can be more empowering for the reader.

Secondly it is a multi-levelled account. Alongside the story that is presented chronologically, quotes are included from those involved, together with researcher reflections and thematic analysis. The purpose here is to create a lively account but also to derive a history that works at different levels. The thematic analysis that is

run alongside the story provides the potential for more conventional theory building to play its part in the research. Sometimes theory links are made.

Finally, by using an action research approach, particular attention is paid to there being value for the various stakeholders in the research. These stakeholders range from those directly involved in the original learning history, to those with a different set of similar challenges elsewhere who seek to learn from it, through to other interested parties including academic audiences or those working in entirely different settings who might also find insights in the history here presented. In short this is not extractive research and the learning history is not an 'output' but a point around which the research hopes to gather interested parties. With this in mind, workshops, online support and other forms of engagement are being considered.

How is a learning history produced?

A learning history is described as a 'jointly told tale' (Van Maanen 1998) between outsider (researcher) and insider(s) (protagonists). Starting with a tangible happening or outcome, in this case, Barnsley's dramatic record on carbon reduction, an interview is carried out with one or two people close to the happening. This is taped and transcribed. The tape transcripts are read through systematically twice and themes are annotated on the second read through. The researcher adds too any thoughts or reflections as they occur. Drawing on this annotated transcript and on other web-research and supporting materials, the researcher then develops a storyline that emphasizes a set of key chronological moments or phases. This account is then textured by presenting it alongside some of the key themes and reflections that have been identified together with some of the key quotes from the interview. This is a play with the form of presentational knowing¹ but also borrows from ideas of presenting a learning history (Bradbury and Mainemelis 2001; Roth and Bradbury 2008 (in preparation)) as well as some aspects of narrative inquiry (Connelly and Clandinin 1999). The history of the learning is presented in a way that hopefully allows further learning on behalf of the reader and *on the reader's terms*. The reader, be he or she the original protagonist (Dick), an academic at Bath University or an environment officer seeking innovation in his or her own locale will have different learning agendas after all. We cannot encapsulate learning in a one-size fits all step-wise account.

Links to Theory

Links to theory are made in places where it is deemed relevant. These are very provisional and relate to the theoretical territory that the researcher has been covering. They are mainly offered as an aid to reflection on the piece. A reader may wish to skip them if they break up the narrative. In the next stage of the research

¹ Action research (AR) places a value on different ways of knowing other than the usual conceptual-theoretical knowledge associated with academia. Different ways of presenting knowledge via story, drama art and other forms of representation is a key element of AR.

some of these links will be developed more fully. Themes that arise directly from analysis of the transcript are summarised at the end of the learning history. Some links to other learning histories might be mentioned. These will be more fully worked at the next stage of the research where common themes across the learning histories will be developed.

How to read this account.

The intention of this account is to ‘invite’ readers into this learning history and to participate with what has happened. In the research, two particular kinds of readers have been identified to aid this process and some guidelines are offered below if you have been invited to read the learning history in this way.

The **active reader** is someone exploring the value and relevance of the History for their own learning. They are particularly invited to find meanings pertinent to their own context and experience. Read the account through being watchful of your own responses to the Learning History: Note any events, themes or reflections that seem to resonate or be familiar to your own setting. Note too anything that triggers your interest in some way. Preferably mark these up in some way on the learning history. Then, periodically revisit the learning history (weekly, fortnightly or monthly) and your mark-ups and ask yourself has the learning history come to mind or influenced your actions in any way in the intervening time and if so in what way.

The **participating reader** is someone who was been directly or indirectly involved in the history that is presented here and has been invited to comment.

A **direct participating reader** will have been directly involved in some of the events described in the learning history and, with their consent, may be named. You will likely have been invited by the researcher to add your perspective to the account presented here. Such readers might have many responses to the Learning History, ranging from thorough enjoyment through to outright dismay at how events are represented. Whatever it is your response is invited. There is no onus on these readers to check this account though factual corrections are very welcome. If you can add a story that fills in a gap, that adds to the drama, or that casts a different light on things described here then this is of particular interest. The emphasis is on adding perspectives rather than removing parts of the story. The learning history as it stands will not be reworked – however a multi-perspective version will be prepared which will include inputs from participating readers (in “more about” boxes for example). This will hopefully help to create a richer, more filled-out account.

Those not mentioned directly, but nonetheless impacted in some way by what is described in the learning history are termed **indirect participating readers**. Such readers may well know of the innovation described, but will likely be less familiar with the more human story that lies behind it or have seen it presented in this way.

They can offer an interesting perspective on what this innovation has meant for them – or in the light of the learning history what they have found interesting or how it might have shifted the view they held.

In general the invitation extended to participating readers is more in the spirit of a group gathered sociably around a pub table recalling an event of which they were a part, rather than, say, a University debating team trying to determine the exact chronology of events or the importance of such events' impact.

Key

Theme: This is a theme occurring at this point in the history – may refer to themes in other learning histories.



RR

These are 'Researcher Reflections' that are included through the learning history to draw out themes or point to interesting areas for discussion

This is a quote from elsewhere: either from the public domain or from another interview regarding the case.

A. N. Other 28.11.06*

R: These are inputs from the researcher taken directly from taped transcripts.

PRESS RELEASE

18 July 2006

These sections include third party information about the case that is in the public domain. They include press releases, website information and general public commentary.

These are quotes taken directly from interview transcripts. Where initialled they refer to whomever gave the perspective. Where not initialled they are from the original interviewee.

More about:Something in the history

Related Section(s): whichever section in particular it pertains to

Time Period: 2006-2007

Added by: a participating reader

This is an **extra perspective** on the story added by someone who has read it and is filling in a missing gap in the story or sharing their memories of a particular event of which they were a part.

Important Disclaimer

This document was written by a researcher and is based predominantly on just one or two interviews with people close to the event/happening together with information available in the public domain. Its purpose is to stimulate discussion and learning about low carbon initiatives in or close to local authorities rather than be a definitive record. It does not set out to be an exhaustive case study that highlights all the contextual factors or ramifications connected with the example. Rather it intends to present to the reader an account that is accessible and understandable and hopefully resonant in a way that enables them to learn whatever it is that might be relevant to their own circumstances.

The author is aware that there may be different versions of the story given here as well as different perspectives on the overall example of innovation discussed. Such alternate or further perspectives are invited.

Finally there are actors mentioned in this paper who, in the story told by the interviewee, have played a significant part. Their actions are in places described and these descriptions are important to the learning history. As a default, 3rd party names are made anonymous. However where it is judged appropriate by researcher and interviewee(s), and this is often the case, consent is sought from some actors to use their real name. This is done in the interests of giving the learning history a reality as well as to acknowledge the part other people have played in what has happened. In all cases efforts have been made to ensure that those included in the story are handled with due care, respect and sensitivity. However readers should remain aware that descriptions pertaining to third parties are developed through the lens of the interviewee rather than via the third party themselves.

**For further information/comment or otherwise please contact
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Barnsley: It's a no-brainer!

Introduction – The Public Story

In the past two years, Barnsley Metropolitan Borough Council (BMBC) has become increasingly recognised for the strides it has made in reducing carbon emissions. Reporting in 2005 that it had already hit the 2020² Government targets on carbon reduction of 40% on its own estate³, Barnsley was starting to reap the results from a systematic, structured and integrative approach to energy management that has been developed there over the past 20 years.

A slowdown in further reductions in emissions is often expected as the low-hanging fruit of energy efficiency are picked. However this is not the case at Barnsley. As its Biomass implementation policy starts to be acted upon, emissions reductions are in fact starting to speed up and are predicted to reach 60% by 2010, beating the nationwide target by some 40 years. Fully endorsed by the council cabinet in 2004, the Biomass implementation policy commits the council to considering biomass from local waste wood as a first choice for all new heating installations in public and commercial buildings or where any major refurbishment is taking place. The policy doesn't insist on Biomass unless the 'whole-life' costs are favourable compared with systems that are fuelled by more traditional sources such as gas or coal.

The heat is on

South Yorkshire is breaking its remaining ties with coal and setting itself up as a major user and supplier of green fuels

Terry Slavin

Wednesday September 13, 2006

The Guardian

The battle of the brooms is over. After a decades-long war against drifts of coal soot inches deep on their window sills, the residents of Sheffield Road in Barnsley have finally seen the back of King Coal.

Fifteen years after the last coal mine in Barnsley was boarded up, the polluting remains of the coal economy in this South Yorkshire town are being replaced by a clean and green, but still homegrown, alternative: biomass - in this case, wood that is grown and collected from the surrounding area.

Dick Bradford is the eco-warrior behind the project. Under his 21-year watch at Barnsley metropolitan borough council, most lately as chief engineer, the local authority has slashed carbon dioxide (CO₂) emissions on its own estate by 40% on 1990 levels by introducing measures of burning coal more efficiently. Instead of following its neighbours, which long ago replaced coal boilers with gas equivalents, Barnsley is now installing wood heating in all new public buildings and refurbishments, embracing biomass fuel as a preferred energy source. Because wood is considered carbon neutral - any CO₂ released in the combustion process is mopped up by growing trees - the move could slash the council's CO₂ emissions by 60% by 2010, 40 years ahead of the government's 2050 target.

For Bradford it is a simple equation. "From an environmental point of view, heating goes from being highly polluting to no carbon," he says. "It's a no-brainer."

Downloaded on 19 July 2007 from
<http://environment.guardian.co.uk/energy/story/0,,1870765,00.html>

² The reduction target is set relative to 1990 levels of carbon emissions.

³ Figures are with reference to the heating & energy bill but excluding transport,

The policy appears to be working with biomass systems now installed and running smoothly in a number of sites including a social housing block, a school and some civic buildings. Most recently, in early 2007 the council's own headquarters at Westgate Plaza was opened to much acclaim for its all-round sustainable design that includes rainwater harvesting, daylight control and, of course, biomass heating.



Figure 2: Fuel Delivery at Westgate to its modern biomass boiler system

As these first systems create a demand for woodchip, the supply chain is becoming more robust. The council has put a storage and drying facility in place and it plans to increasingly source wood from its own estate. With a potential annual yield of wood of some 45,000 Tonnes in the South Yorkshire area, of which about a third sits within Barnsley MBC, the projected growth in demand can be met with costs predicted to drop as economies of scale kick in. Woodland management practices are evolving too with a positive impact on the biodiversity of the region, a reduction in landfill and the creation of jobs.



Figure 1: Westgate' modern biomass boiler system (all photos courtesy of Dick Bradford)

From David Miliband's BLOG
Barnsley leads the way

I opened Barnsley Council's new offices on Friday and discovered a rival for Woking's sustainability agenda. Barnsley are using biomass - including from the town's clippings of its thousands of municipal trees - to slash carbon emissions from its heating systems. It's such a simple idea; every authority has trees, and their growth can be put to good use.

Posted on 22 May 2007 09:23 by **David Miliband**⁴

Barnsley – an innovation?

There was no doubt that from what is publicly known about Barnsley it was an ideal candidate for this learning history study. What is happening there is innovative, has had a demonstrable impact in reducing carbon emissions and in doing so has made direct use of zero-carbon technologies. As I prepared to arrange a visit, there was no doubt either as to whom I should speak. Much of Barnsley's achievements appeared to be down to one man who had been working there for some 20 years – Dick Bradford, principle design and energy engineer at Barnsley metropolitan borough council.

Researcher Comment: If Barnsley, why not everywhere?



Figure 3 Dick Bradford, Barnsley MBC

The couple of hours I spent speaking to Dick in June 2007 were at once inspiring and puzzling. As he laid out his thinking and approach I found myself relaxing into a place I don't often find myself in with regard to climate change – a place of certainty. There was a sure-footedness here that was refreshing. Everything as he described it seemed obvious, straightforward, and eminently achievable. He

found it difficult. By the end of the interview after two hours on solid ground, I could empathise with his frustration and at the same time I felt puzzled. If it really was 'a

⁴ The then secretary of state for the environment. Downloaded on 19th July 2007, from http://www.davidmiliband.defra.gov.uk/blogs/ministerial_blog/archive/2007/06/21/13044.aspx

no-brainer’ then more people surely would be doing it. What was particular about here that made it seem so simple, when clearly it isn’t elsewhere?

As I revisited the data of the interview and supplementary reports, it became clear that the capability built up at Barnsley was not a simple implementation of the obvious, but a continuous and carefully crafted application of good engineering, strategy, common-sense and timely confidence. So many innovative moves had been simply described as mere steps along the way: the formation of an ESCO⁵ to supply wood-based heat, the public partnering with the Local Forestry commission, the digging up of roads to install piping, the apparently seamless raising of funds to invest in expensive new boilers – all these steps and more could prove to be major stumbling blocks elsewhere.

From that observation came a number of interesting questions from which to approach the writing of this learning history. First, what is particular to Barnsley, as a Borough, or Dick as a champion that makes it seem easier there than elsewhere? Second what have they done there that could indeed be transferred and be of use to others wishing to learn from their approach? The storyline that has been developed spends some time on both questions – trying to communicate some of the ‘how’ that might well be applicable elsewhere whilst at the same time heeding the unique characteristics of Barnsley. To strike a balance, facts and figures are deliberately included though they are not foregrounded. What this learning history sets out to do then is to demystify the apparent ‘simplicity’ of Barnsley and in so doing try to gain insight into how complex challenges can sometimes become simple.

⁵ Energy Services Company: a company that supplies energy in the form of the service (e.g. heat, lighting, cooling..etc) it is providing and hiding issues from the consumer that have to do with the energy source that is used to derive such a service.

Prehistory: Creating a context of trust.

To fully understand how Barnsley has got to where it is today requires an insight into events some 20 years ago. The following two scenes set out some important history and two of the key themes of the Learning History are already quite evident in these passages.

Scene 1: A home near Barnsley

When: mid 1980s

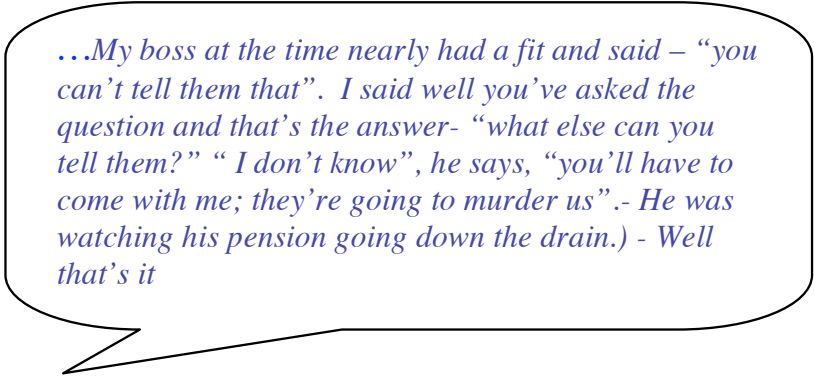
Where: A home near Barnsley

What: District heating system isn't working

Who: Dick Bradford – Barnsley Metropolitan Borough Council (MBC)

Dick's boss - Director of Architecture

Sitting in front of the telly in his home, Dick flicked through the large file of complaints that lay in front of him. Recently appointed on a temporary basis as acting Chief Heating Engineer with Barnsley MBC, his first task was to sort out the district heating scheme. It was no easy task. The council had already made several attempts to solve it, but to no avail. The complaints through the winter from tenants just kept on mounting. As he worked through the complaints file a picture started to form in Dick's mind. "*Could it be that simple?*" he asked himself. It was. The pipes between the boilers and the radiators were too small. They had been designed for a 70% load which for a heating system in the winter made no sense at all. When it was cold, everyone would have their heating on. Grimly, Dick drafted a report recommending the immediate replacement of the pipes. The high cost and disruption implied by the report was not surprisingly met with despair by this boss.



...My boss at the time nearly had a fit and said – “you can't tell them that”. I said well you've asked the question and that's the answer- “what else can you tell them?” “ I don't know”, he says, “you'll have to come with me; they're going to murder us”.- He was watching his pension going down the drain.) - Well that's it

Theme: The technology considered in terms of its infrastructure and how it's used (technology in use) Vs being considered as standalone.

Theme: Obvious problem, Obvious solution.

Scene 2: Recommendation passed, with a caveat.

When: mid 1980s

Where: Council Committee Meeting

What: Report going through for approval

Who: Dick, MF - Chief Architect (Housing)

The report was submitted to the predominantly Labour council for approval. Dick and his boss MF attended

the committee meeting where it would be discussed and as it came up on the agenda, Dick sat back and *'waited for the blast'*. None came. It was

swiftly moved to group where the decision would be made. The following week, the group returned

a decision that the recommendations outlined in the report had been approved.

Puzzled, Dick later asked a colleague who had good links with the members as to why approval had come so readily (see quote above). His colleague explained that it had been a simple matter of trust. However with that trust came a responsibility to make it work.

... "Oh yes" he says – "I knew they're going to let you do it. It's because they trust you but if you screw up they're going to crucify you"..... well I'm still here. You see that's where I think that the trust has built up over the years because they've had some real knotty problems. But everything we've said has always worked – they haven't always liked the cost but it's always worked.

Theme: High reputational risk though it was perceived as low risk by Dick. Other learning histories also point to low-risk conditions needed to innovate/enable change.

Theme: The importance of trust and cross-party support. Here it's built on things working, problems being solved.

The new district heating pipes were installed and worked well. And with that new system came the start of what would be a significant enabling factor for Dick's work in the future: trust and cross-party support.

Perceived risk inversely proportional to confidence and expertise?

The preceding passage highlights two themes that recur throughout the learning history. The first theme is of a problem and its solution appearing quite obvious. Why Dick saw something so clearly whereas others before him hadn't is a significant theme and one that will be explored later. The second theme derives from the first and it is to do with risk. There was a high reputational risk involved here – for Dick and his boss who balked at his proposal. Yet this appears to have been mitigated entirely by Dick's conviction that he was right and his ability to utilize his technical knowledge. What Dick perceived then as low risk may be perceived by someone else as high risk especially if there was any doubt in their minds as to whether their proposal would work.

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Phase 3: Squeezing the Lemon

When: 1986-2000

Where: Barnsley Metropolitan Borough Council (BMBC)

What: Wide ranging Energy Efficiency measures

Who: Dick Bradford and his team

In 1986, concerned by a high energy bill⁶, the authority charged Dick and his team to go away and make savings of 15% within 5 years and offered them financial support to do so. A wide-ranging set of efficiency measures ensued. A more radical approach started to be taken with buildings design.

More efficient, comfortable heating systems using radiant heating⁷ (underfloor and overhead) were installed in new and refurbished buildings together with heat-recovery ventilation systems. Energy usage patterns, particularly in social housing, started to be addressed too. Meters were installed in tenant's flats and new methods of billing were introduced that meant tenants no longer paid a flat rate but paid for what they used. Further crucial efficiency gains were enabled by configuring and

We don't do things the way other people do them – and I'm quite gratified by that because I don't particularly want to do things that other people do

They [tenants] used to have all the windows open in the middle of winter, curtains blowing in the breeze to let the heat out because they weren't going to turn the heating off because they were paying for it. So I thought this is silly...

programming energy management systems. Though standard 'kit' was installed, the team started to develop a base of customised software to control it. It took some persuading to get the manufacturing company to sell them the unconfigured systems. However it paid off. The energy management systems they developed

allowed them to manage their buildings' energy in a highly optimal way - all from their desks at the council offices.

*We simply buy kit and have that kit installed by our electrical lads and then – that's what these computers do here- and then we are constantly **squeezing the lemon**.*

Theme: Development of a technical skill base.

By following a systematic structured approach, energy costs and emissions started to tumble. Within 4 years 20% of the energy bill had been saved⁸. When government targets were put in place in 1990, Barnsley was already '*ahead of the game*'. By 2001 the '*squeezing of the lemon*' had saved Barnsley a further 20% on the 1990 baselined carbon emissions meaning the government target for 2010 had already been met.

⁶ Total energy bill was in the range of £4M in 1986 (source: interview)

⁷ Running costs of radiant heating is approximately 20% less than conventional radiators

⁸ Amounting to approximately 16K tons of CO₂

Theme: Development of a technical knowledge base that includes feedback and incorporates the way the technology is being used.



Capacity Building

In this period the skills and capacity had been built to get a real handle on the energy consumption in the borough and to prove further capability with more good results. This positioned them well for the next phase.

For much of the 90s efforts at Barnsley had been driven by purely economic factors. It was at about the turn of the millennium that issues of climate change and energy security started to play increasingly on Dick's mind. With the closure of the last remaining coalpits and the shift to North Sea oil and gas he reports the *nagging realisation that you are dealing with a finite resource. It ain't going to last forever.*

Faced with this problem Dick recalls the advice of a former colleague: *'when you're faced with a problem you've got 2 choices. You can either do something or you can do nothing. If you do something you might be criticised for it, if you do nothing you certainly will be'.*



Here the high-risk option is framed as doing nothing. It is interesting to note that wider macro-economic and political issues on the landscape were not being ignored despite the successes of the 90s. Organisational theorists report how success can often lead to a blindness to wider landscape changes as successful innovators become 'locked-in' to *routines that have worked well for them in the past* (Miller 1994; Christensen 1997).

Scene 4: Swiss Epiphany

When: May 2003

Where: Jura region of Switzerland & Austria

What: Fact-finding mission

Who: Dick Bradford, and Officers and some Members

from the other South Yorkshire Authorities,

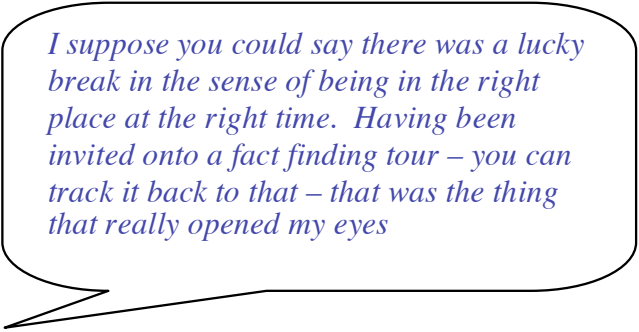
Robin Ridley from South Yorkshire Forest Partnership



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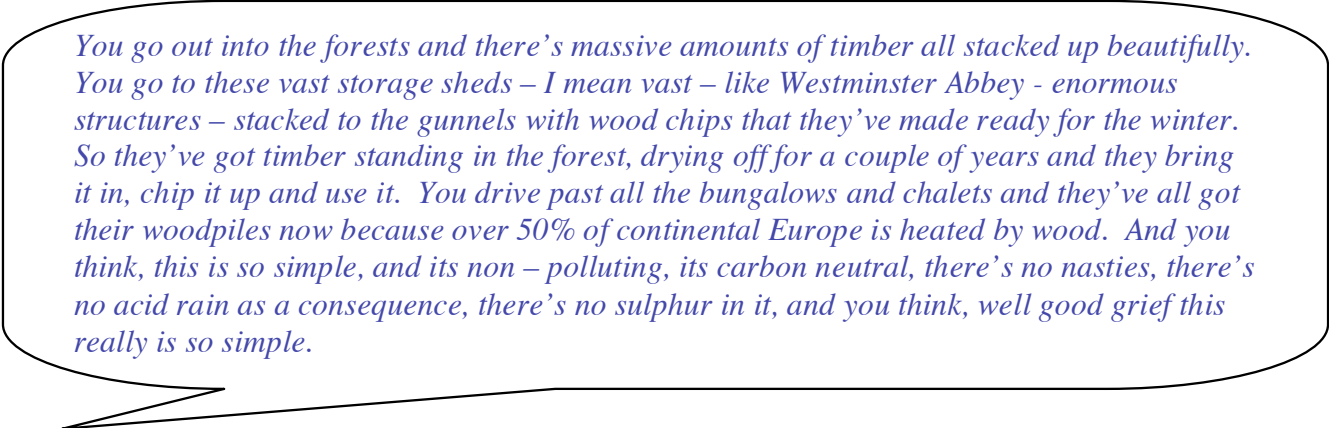
There's a missing part of the story here as to why Yorkshire Forestry Commission had decided to do this.

Concern for climate change and energy security only increased in the early years of the Millennium. In 2003, when the Yorkshire Forestry Commission approached Dick and invited him on a fact-finding mission to Europe, he was happy to go along. The aim of the trip was to explore the possibility of using wood as a fuel source. The sheer scale of the wood-fuel operation in continental Europe was impressive and at that point a vision started to form in Dick's mind as to what could be achieved at home.



I suppose you could say there was a lucky break in the sense of being in the right place at the right time. Having been invited onto a fact finding tour – you can track it back to that – that was the thing that really opened my eyes

Theme: The conditions for an innovative idea combine openness and determination with an element of chance happening



You go out into the forests and there's massive amounts of timber all stacked up beautifully. You go to these vast storage sheds – I mean vast – like Westminster Abbey - enormous structures – stacked to the gunnels with wood chips that they've made ready for the winter. So they've got timber standing in the forest, drying off for a couple of years and they bring it in, chip it up and use it. You drive past all the bungalows and chalets and they've all got their woodpiles now because over 50% of continental Europe is heated by wood. And you think, this is so simple, and its non – polluting, its carbon neutral, there's no nasties, there's no acid rain as a consequence, there's no sulphur in it, and you think, well good grief this really is so simple.

[there's no nasties: see “More about Air Quality” at the end of the history]

Theme: Recurring theme of the solution actually being simple

Phase 5: Partners, Feasibility and Strategy

When: May 2003 – May 2004

Where: Barnsley MBC

What: Testing the business case

Who: Dick Bradford

South Yorkshire Forest Partnership, Yorkshire Forward, EST, DEFRA, Neighbouring Councils.

Though the vision was simple, the means of realising it clearly was not. Though convinced of the potential of wood as a Biomass fuel, Dick did not rush into anything on his return to the UK.

Instead the period directly following this trip saw a series of projects and consultations that were aimed at clarifying exactly how the move to wood-based biomass might be achieved.

I came back from that enthused. So I sat down and wrote – mind you it took me nearly a year to do it because there's a lot of stuff you have to pull together and you have to get it clear in your own mind as well. But I wrote the Biomass Implementation Policy.

In this period, there was extensive consultation within the council and with external partners. With help from South Yorkshire Forest Partnership the yield of the council's own woodland estate was assessed as well as that of other woodland in the area⁹. Sources of potential funding streams and collaborative projects were also being identified and this included support from Yorkshire Forward, DEFRA and the Energy savings trust (EST).

Theme: Partnership working combining funders, NGOs other councils and so on

Potential sites for a first trial biomass boiler installation were also being identified. One of these sites, the council's own Smithies Lane Depot was particularly attractive. Not only was its boiler was coming up for replacement, but the area already was a site for the storage of local arboreal arisings, used for garden mulching, meaning woodchip could be directly available.

A two-pronged attack was being thought out. Not only were new wood-chip boilers being assessed, but the conversion of existing coal-boilers to run on

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South Yorkshire Forestry Partnership playing an enabling role again.

⁹ The yield of 12,000 HA of south Yorkshire woodland was estimated at 45Ktonne/year. One 500KW boiler requires approximately 350T/year.

wood pellets was also being considered. Wood-pellets are pressed from sawdust and imply a different and more expensive supply chain¹⁰. Nevertheless, long-term, converting the existing coal-boiler stock would greatly enhance the speed at which the transition to wood-fuel could be achieved.

Theme: Timing – combining short and long-term views

In early 2004, on the request of South Yorkshire Forest Partnership a ‘Pathfinder Project’ was kicked off with neighbouring councils, under Barnsley’s management to assess the suitability of wood pellets for coal boilers with conversion in mind. Wood-pellets started to be burned at various sites in South Yorkshire through 2004 – the first of these was in April at Kirk Balk Secondary School, Barnsley.

This period then could be understood as a period of detailed feasibility and consultation in which stakeholders were brought on board, technical details were being hammered out and costings were being assessed. Whilst a technical niche was being prepared in which to launch Biomass, a strategy was also being prepared to go alongside it.

¹⁰ A pellet-press costs in the region of £5M

Scene 6: Biomass Implementation Policy: The principle & the particular

When: May – June 2004

Where: Barnsley MBC

What: Approval of the Biomass Implementation Policy.

Who: Dick Bradford, Barnsley Council Cabinet members.

As the results and information was coming in from the consultation and feasibility work the business case for bio-fuel in Barnsley was constantly being refined and better understood.

Capital costs of biomass systems are high – some 10 times greater than the costs of a comparable gas-fuelled boiler. When costs were worked out on a whole-life cycle basis there was a different picture (see: Appendix C). Running costs would be significantly less¹¹ and insulated too from erratic fuel market prices. Over 25 years biomass was estimated to cost some 40% less than a similar gas system. As energy management reported into the financial directorate meant the benefit of whole-life costing would not be lost across the organisational structure as can sometimes be the case. Furthermore potential sources of funding to cover the high capital costs of early installations were being readily identified.

Theme: ‘Whole-life costing’ – a financial innovation in itself was enabled by the structure of the organisation.

To protect the council from the risk of using a new fuel for which there was an immature supply chain, the formation of an ESCO to supply heat was considered from the start. That way as the wood-supply chain found its feet, fluctuations in the quality of supply would be invisible to the council.

*the way that it was written was on the basis that every project would be viewed on its own merit and we were dealing here **with a principle rather than a particular**. And the principle was that providing that the business case stacks up then this is the way we should be going. We're not daft – if the business case doesn't stack up we're not going to do it*

Theme: Designing out risk by breaking down into projects and speaking ‘the business case’ fluently.

¹¹ For a 500kW boiler: Capital investment for gas estimated @ £18K; wood boiler estimated £150K; Running cost for gas estimated @ £45K/year + climate change levy (CCL) vs. £12K/year for woodchip. Over 25 years, cost of Biomass comes in at £300K vs £500K for gas (2004 prices).

In May 2004, Dick completed the Biomass Implementation Policy, a short, but fully substantiated document that recommended that from now on Barnsley MBC should consider Biomass for all new and refurbished heating installations and further,

should actively seek to harvest Biomass wood-fuel from its own estate¹².



The way the Biomass Implementation Policy was set out effectively appears to have designed out risk. There is 'an offer you can't refuse' quality to it. It relates to earlier themes of trust too.

What had started as a vision in Europe a year before had now been efficiently translated into a plan for delivery that had then been distilled back into a long-term strategy. On June 9th the Strategy went before the council cabinet and was approved without a murmur.

That went to cabinet and was approved immediately. And I didn't even have to go to present it which was rather interesting because normally that's what happens

Theme: Earlier trust now reinforced more formally with a mandate for the Biomass policy.



The project moved from a vision conceived of in Europe, through a detailed analysis of delivery and then back to a vision for Barnsley in the form of a strategy. The way that the principle and the particular are being combined here a significant factor in its success?

Theme: Combining the principle with the particular, the near with the far term, the vision with the analysis.

¹² May 2004, Biomass Fuel heating – opportunities for Barnsley MBC Downloaded on 30 July 07 from http://www.wood-fuel.org.uk/resources/bmbc_biomass_cabinet_report_may04.doc

Scene 7: Busting the Chicken and Egg scenario: Sheffield Road Flats.

When: Winter 2004/2005.

Where: Barnsley MBC

What: First Biomass implementation

Who: Berneslei Homes, Sheffield Road Tenants, Econergy Ltd, Silvapower Ltd...etc



Figure 4: Britannia House - Sheffield Road Flats

With an understanding now of how biomass could be made to work, Dick's concern was for what he called *'busting the chicken and egg problem'* which he described as follows:

– Who in their right mind is going to put biomass boilers in if you can't get the fuel for them? Then again, who is going to be making fuel for biomass boilers if no ones installing them?

It wasn't long before there was an ideal candidate for the first Biomass boiler installation. At Sheffield Road Flats the existing coal boiler wasn't going to make it through another winter.

So what we did, courageous move number 2 [after putting the policy through], was to say OK we have a particular site that's in all kinds of trouble anyway, needs a complete refurbishment, needs a new boiler plant etc. Why don't we put a biomass boiler plant in and put a back up gas boiler plant in as well. So that if the market place responds – fine – if the market place can't respond, we're not putting people at risk.

Theme: Designing out the Risk.

Theme: Window of opportunity offered by stock renewal. In this case, everything was in place and ready to go so that such an opportunity could be availed of.

Through the winter of 2004/2005 a major project commenced: the energy efficiency¹³ of the three blocks of flats at Sheffield road was improved; two new Biomass boilers¹⁴ together with a backup gas boiler were installed; a fuel store was built and an integrated energy management system (EMS) was installed which could be controlled at the council's offices. This would allow energy usage to be monitored and billed accurately reducing by some 50-70% the overall demand in energy (see earlier description in 'squeezing the lemon') allowing the coal boilers to be replaced with smaller biomass boilers.

Theme: Technology changes deployed in step with changes in energy use and supply models too.

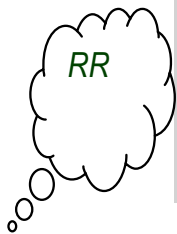
The EMS would also help ensure smooth running of the new system and by using the gas boiler as backup the existing coal boilers were successfully decommissioned seamlessly through the winter months. The only disruption for tenants was 1 day when a new heating system was installed in each flat.

¹³ Cavity wall insulation, double glazing and roof insulation were carried out.

¹⁴ A 320kW and 150kW were installed in one of the 3 blocks of flats and connected to serve the third building

Funding to the tune of £350K for the new boilers had been secured from the EST (Development & Capital Grants), Yorkshire Forward (via South Yorkshire Forestry Partnership), the DTI (Bio-energy grant scheme), and the EEC.

I obtained various grants to pay for both boiler plants. So it didn't cost the council a bean – all they had to pay for was what they would have had to pay for anyway which was the re-furbishment of the buildings and the heating systems within them.



Not much was made of getting this funding in the interview, yet pulling in this amount of funding seems to be worth pausing on? Other authorities baulk at the point of getting capital to do things. Grants played a crucial role in reducing risk and enabling the projects to go ahead.

Yes – and are they really widely available & do officers have time to complete them with strong likelihood of success?
Active Reader Jan 08

With this project the careful planning and analysis that was behind the Biomass Implementation Policy could be put into practice. The ESCO Econergy Ltd was charged with installing the boilers and sourcing the wood. A local woodfuel company Silvapower Ltd was started to supply the woodchip from local sawmill and forestry waste.

Neither the chicken nor the egg had come first – they arrived more or less together.

Theme: Implicit in this is a lot of careful timing between different agencies. In this case the timing is in their 'readiness' of the various links in the supply chain.

Scene 8: Reducing Costs: Smithies Lane

When: Early 2006

Where: Smithies Depot

What: Second Biomass implementation

In early 2006 the second installation of a 500kW wood chip boiler with a backup oil boiler took place at Smithies Lane Depot, a centre that handles large quantities of waste wood¹⁵ from the local borough as well as housing 450 council employees. It was an expensive but again low risk move for the council: funding for the boiler again came from the EST Community Energy Grant a DTI Bio-energy capital grant.



Smithies Lane is a complete closed loop and that is the footprint for expanding the methodology that we've employed there to the rest of our sites so that we drive our fuel costs towards zero.

Figure 5: Waste wood at Smithies depot

Prior to the installation, in September 2005, an application had been put through council to build a woodchip production and 700T capacity fuel storage and air-drying facility on-site to prepare the way for truly locally sourced woodchip. A careful feasibility was carried out prior to the application using an EST development grant. The application drew on this feasibility and referred to the earlier strategy and the success of the Sheffield Rd flats. Some of the funding would come from the Pathfinder 2 funding that had been secured by South Yorkshire Forestry Partnership. It was once approved immediately and work completed on this facility in late 2006.

Theme: Stepwise approach. Building on previous successes and checking feasibility to ensure success.

With ESCO agreements updated to ensure that this local chip would be sourced as a first priority where possible the costs of fuel for the council now had the potential to go toward zero.

Theme: A combination of short-term project with far-sighted strategic goals.

¹⁵ some 300T in 2005



Figure 6: Construction of the wood storage and drying facility at Smithies

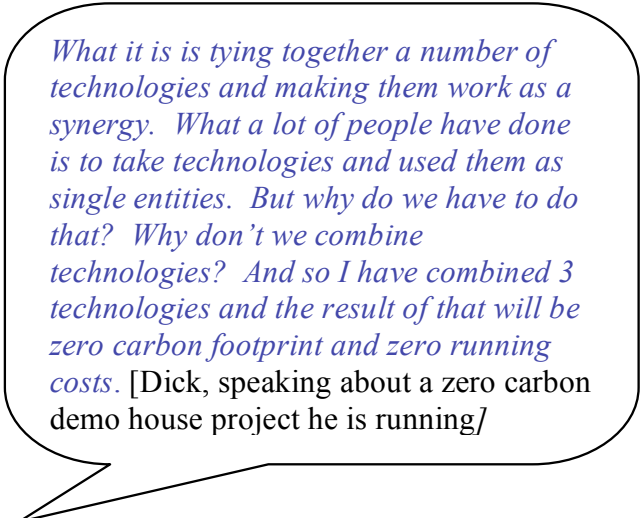


Figure 7: The completed wood storage and drying facility at Smithies

Reflection: If it's a no-brainer – then why isn't everyone doing it?

Returning to this earlier question, there is a striking theme through this learning history that may help to explain it. At first glance it appears that it is Dick's technical expertise that has been pivotal to the successes at Barnsley. This echoes hearsay accounts of similar successes at Woking where Allen Jones is credited with having known technically what to do. However this interpretation would be a simplification. There are many technical experts who don't achieve such results. No, the central point of success seems to pivot around an expertise of not the technology itself but of the technology-in-use.

Throughout the interview technology was never described as a standalone object but rather as something fully embedded in a more complex web of other technologies (e.g. pipes connecting the creaking boiler systems), user practices (e.g. metering and tenant's heat use patterns), engineering skills (e.g. maintenance issues for converted coal boilers were carefully assessed), market forces (e.g. wood supply chain) and financial practices (e.g. whole-life costing and funding initiatives). This particular way of seeing technology is counter to what Rip & Kemp argue is the more pervasive view in society today that sees technology as a separate 'object' or at most a process of production – what they call a 'transformer' view (Rip and Kemp 1998).



What it is is tying together a number of technologies and making them work as a synergy. What a lot of people have done is to take technologies and used them as single entities. But why do we have to do that? Why don't we combine technologies? And so I have combined 3 technologies and the result of that will be zero carbon footprint and zero running costs. [Dick, speaking about a zero carbon demo house project he is running]

Technology as described by Dick in this learning history is however more akin to what Thomas Hughes has famously described as a 'seamless web' in an attempt to indicate technology's inseparable relationship with society (Hughes 1986). From evolutionary economics comes a similar and complementary view that also resonates strongly with what is described here. This is the idea of a technological regime (Nelson and Winter 1982) that has been described as the totality of engineering practices, production processes, user practices, skills, institutions and infrastructures that make up a technology and that guide its development in a fixed way (Kemp 1994). Breaking out of a such a regime is not straightforward and recently there has been more literature that describes an even more intransigent regime – the socio-technical regime – where technological regimes interlock with other equally rigid regimes in policy, culture, finance, and so on making processes for change even more difficult and unusual (Kemp, Schot et al. 1998; Geels 2004). Using a multi-

levelled perspective on how change occurs in such regimes, Geels proposes that breaking out of a socio-technical regime (level 2) only occurs when external pressure from the social, political and natural environment (level 3 - what Geels calls the socio-technical landscape) come together with capability of new niche technologies (level 1) This appears to have happened at Barnsley where the regime under attack is fossil-fuel based heating. The careful creation of a biomass supply chain and technology fits well with how a technological niche is created:

Initially unstable sociotechnical configurations with low performance....act as 'incubation rooms' protecting novelties against mainstream market selection¹⁶. Carried and developed by small networks of dedicated actors, often outsiders or fringe actors" (Geels and Schot 2007)

Whereas Dick's eye on the macro level of the politics surrounding the future of energy also fits well with Geels & Schot's definition of a socio-technical landscape as the

Exogenous environment beyond the direct influence of niche and regime actors (macro-economics, deep cultural patterns, macro-political development). (Idem)

Dick's descriptions covered the span of the socio-technical system with ease. In a moment he could move from the technical details of a biomass boiler to the more abstract notion of 'heat' supply and upwards to issues of long-term energy supply and security. This breadth of vision appears to be no coincidence with the fact that Barnsley is successfully managing a socio-technical transition to carbon-neutral heat fuel. This is being done in a way that fits well what Geels' model and what some have proposed as 'Strategic Niche Management' (Kemp, Schot et al. 1998; Smith 2004; Smith, Stirling et al. 2005). This term has been coined to try to describe the process by which transitions to new technologies might be 'managed'. Academics have not yet agreed on whether such an approach can be actively applied and if so how. Most would agree however that to do so is not a 'no-brainer'.

Does analysing it this way help? It certainly begs a question. Could similar transitions be effected elsewhere where the full breadth of vision is not invested in one person but, as is more normally the case, distributed across a number of people or departments? In that case there is a question for researchers and practitioners alike: how might that effortless zooming in and out from the particular to the principle be facilitated?

¹⁶ Links to evolutionary economics, innovation studies

Phase 9: Gathering Momentum... and reputation - Westgate

When: Autumn 2006 – May 2007

Where: Barnsley

What: Westgate Plaza – Phase 1

Through 2006, work started on a flagship project that would be a symbol of Barnsley's achievements in sustainability. The new council headquarters at Westgate Plaza was being designed to the highest environmental standards including rainwater harvesting, energy management and, of course a 500KW woodchip boiler. By February 2007 council employees had moved in and in May the award-winning building¹⁷ was opened by the environmental secretary of the time, David Miliband¹⁸.

Theme: Increasing acclaim and reputation being built up at Barnsley.

With an eye on the future, this first phase of Westgate was envisaged to lay the ground for a second phase that would develop the potential for carbon reduction. Connections have been put in place to support Westgate (phase2) that will link the Central Library and Town Hall to the boiler installed in phase 1. Thermal accumulators will be used to match the boiler capacity with the demand in all three buildings. Such projects would be seen as radical elsewhere. Here building on capacity and the proven track record, it is simply another obvious next step in the face of which the normal impediments, such as funding and budgeting, seem to dissolve as the next segment of dialogue illustrates.



Figure 8 Westgate Plaza (Artists impression)
R.h.s Westgate Phase 1; L.h.s: Westgate Phase 2

Theme: Increasing returns on success – innovation becomes business as usual.

R: And there's no problem with digging up roads and putting these mains connections down?

DB: No – just expensive. You're probably looking at a couple of hundred grand's worth of work there.

R: so there's no issue about the money that you need to pay for that then being won back and budgeted in a different department is there?

DB: No..... Well one of the advantages of us being in the finance directorate is our ultimate boss is the bloke who controls the purse strings anyway.

¹⁷ Won Best Public Building award in the Yorkshire and Humber Assembly's Microgen awards 2007

Now: Onwards and Downwards: Toward Zero Cost, Zero Carbon

When: Now and into the future.

The vision of wood-fuelled heating that was formed back in Switzerland in 2003 is well on its way to being realised. As the early projects have amply shown it can be done, others are now in the pipeline. In some cases coal-boilers are being decommissioned and being either replaced with biomass¹⁹ or simply with the heat from biomass boilers distributed via district heating²⁰. The new 'Building Schools for the Future' programme will all be Biomass fired. Forthcoming projects are not confined to the council. As the perceived risk of using biomass heating has greatly reduced, a local community group²¹ are perhaps continuing the trend by opting for biomass and high standards of sustainable design in their new third-sector centre that is being built this year (2007).

The results of the wood-pellet study in 2005²² had been very favourable too to the realisation of the 'two-pronged attack' devised earlier. Adding to the known benefits of wood-pellets

being easier to handle than coal, it had been found that pellets could produce almost as much heat as the equivalent amount of coal.



Diffusion of an idea

The diffusion of biomass outside the council is very interesting to watch and to compare with what theories such as diffusion theory (Rogers 1962) as well as institutional theory (DiMaggio and Powell 1983) tell us about the travel of innovation. The key mechanism for the spread appears to be the shouldering of risk and an articulation of how to do it by the innovator. How far will this approach spread? Will it be limited to Barnsley & surrounds or can it breakthrough to other sites?

Reduced maintenance costs, and zero carbon taxes on the fuel put it at a parity cost-wise with coal and cleared the way for the conversion of existing coal boilers to pellets once the supply chain becomes viable. Pellets are currently priced at £31.30/MW vs. £18/MW for coal. This cost should drop as pellets start to be produced locally – Yorkshire Forward and a commercial partner are starting a pellet press business in the area.

¹⁸ The overall development was a private finance initiative – but the capital for the boiler was paid for by the developer. Westgate (phase 2) is waiting for finance to be in place in order to start.

¹⁹ E.g. Aldham Farm scheduled late 2007 for a boiler plant replacement.

²⁰ E.g. King St Flats to connect to the Sheffield road flats' boiler.

²¹ Voluntary action Barnsley.

²² April 2005, Barnsley MBC, property and procurement. Wood Pellet Burning Trial. Downloaded on 30 July 07 from http://www.wood-fuel.org.uk/resources/wood_pellet_trial_report_final.doc

The local wood-chip supply on the other hand is well on its way. Every three weeks, 6 tonne of woodchip is delivered into Westgate to supply the boiler there. The cost works out at £11/MW. However as Smithies Depot starts to come online with the borough's own wood, the cost will drop to a mere £0.20/MW.

We're not talking about deforesting Britain but we're talking about sustainable management of the woodland which is something that hasn't happened for decades, and with the volumes of material that.. you can tap into that would probably meet 20% of the country's needs.

All this amounts to a viable, sustainable basis for driving heating costs on the council's own estate down to zero cost and zero emissions. Supplying wood in this way could be applied across the UK. Particular to Barnsley however is its history of coal. With some 8K tonnes of coal still being burnt in its current stock of 133 coal boilers across 66 sites almost 19K²³ tonnes of CO₂ in Barnsley MBC could be reduced by replacing the existing fuel with biomass. This single measure alone would see the council reach the government set target of reducing CO₂ by 60% by 2050²⁴.

Theme: There is a contextual factor here specific to Barnsley which is its tradition of coal and some inverse good fortune arising from the coal not having been converted to gas earlier making the transition to biomass possible. Because BMBC had for years used their Energy Management Systems to control coal efficiently there was no overriding need for change.



Hitting such targets seems to me a side-effect rather than the main driver at Barnsley. The main driver seems to be vision based on far-sighted common sense and an understanding of structured, well-timed engineering as the mechanism to realise such a vision

Following its current trajectory (see Appendix B), Barnsley MBC is heading toward a 60% reduction by 2010 and real carbon neutrality by 2040 on its heat-based CO₂. But the interview gave a sense that it won't stop there. Using award money won last year, a new demonstrator eco-house is being build that will show how, by combining different technologies, a carbon-neutral, zero-cost home can be built – and it doesn't use Biomass.

And it is aimed ultimately to appeal to the domestic market because if one seriously is going to make any inroads into sustainability then we've got to get Joe Public on board. [DB on the eco-house project]

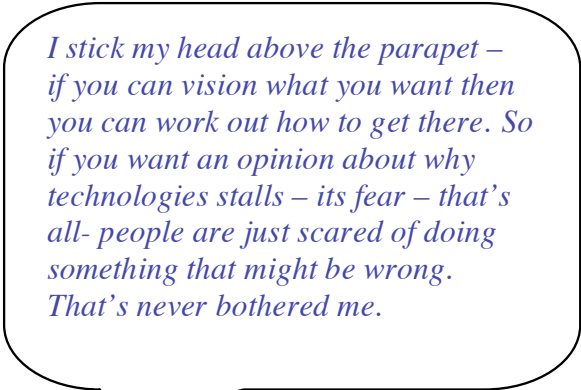
²³ Assumes a conversion rate of 2.38:1 ratio of CO₂ : Coal

²⁴ Barnsley's baseline on heat generated CO₂ was baselined at 70,000 Tonnes in 1990

To equate Barnsley with Biomass then would be to misunderstand what is going on here.

At the end of the interview, Dick recalled how, as a child he used to play with puzzle mazes. *“I used to always start at the destination”,* he said *“And work my way back from there”*.

Here at Barnsley, Biomass technology is a means to an end rather than an end in itself. The way of travelling through a maze toward where you want to go. And running backwards from the destination seems to cast a very different slant on the role of risk and fear in making all those many decisions along the way.



I stick my head above the parapet – if you can vision what you want then you can work out how to get there. So if you want an opinion about why technologies stalls – its fear – that’s all- people are just scared of doing something that might be wrong. That’s never bothered me.

Though the results achieved here are dramatic, the telling of how they were achieved is clear, simple and appears to allow for no other alternative. A no-brainer indeed and only time will tell if it can be so elsewhere.



I’m sorry, I can’t give you much drama

Additional Perspectives: From Participating Readers.

More about:Lead-up to the Woodfuel Study Tour

Related Section(s): Scene 4, “Swiss Epiphany’

Time Period: 2000-2003

Added by: Robin Ridley (via researcher), Jan 2008

South Yorkshire Forest Partnership – using Objective 1 – Forestry Resources Grant (FRG) money funded the Wood Energy Study Tour. Established in 2001 the FRG grant promoted the establishment of new woodlands, the management of existing woodlands and the support of the forest industry sector. As Forest Industries Officer, I was seeking alternative uses for the large amount of low value timber material that is often found in under-managed woodlands. From my previous experience as a forestry worker, charcoal burner and firewood merchant, I knew that heating with wood was a sustainable and cost effective method of reducing carbon emissions. I spent 2002 & early 2003 seeking out Energy and Housing Managers in Local Authorities, Universities and South Yorkshire Police etc. to convince them that woodfuel was a viable alternative. The main problem was one of perception. The level of ignorance was high regarding biomass/woodfuel and there were no reasonable sized installations in existence that people could be taken to. There was no fuel supply chain so inevitably one of the first question asked was “where will the fuel come from?” I spent a long time telling people that if they create the demand then I would create the supply! The main problem remained that people did not fully understand the technology nor supply chain issues- the only way seemingly to get over this was to take them and show them how it really works – hence the idea of the Woodfuel Study tour.

I was working with a number of woodfuel installation companies all attempting to persuade Councils etc. to install their equipment. One of these, Econergy Ltd agreed to arrange a Woodfuel Study Tour

More about:Feasability & Funding: Pathfinder Projects

Related Section(s): Phase 6, Partners, Feasability & Strategy

Time Period: 2003 - 2006

Added by: Robin Ridley (via Researcher), Jan 2008

South Yorkshire Forest Partnership gained funding through Yorkshire Forward for the South Yorkshire Woodfuel Cluster. Pathfinder 1 funded 3 installations and the Wood Pellet study. Pathfinder 2 helped establish the woodfuel supply infrastructure

More about:Air Quality

Related Section(s): all

Added by: Researcher in response to active reader queries. The following is based on a call with Dick B. in Feb 08

The environmental health people at Barnsley did not query the use of wood as a fuel. In other Local Authorities however, air quality has been of concern and an impediment to the use of woodfuel. In the absence of guiding legislation regarding the use of wood as a fuel, older stove technology with the associated woodsmoke is sometimes (mis)understood as the means for producing heat from wood. New Biomass burners do not have the same problem with pollution however as they have a closed combustion system whereby the smoke effectively burns itself. As a result the flue from these modern biomass burners needs to be no higher than that of an ordinary gas boiler.

APPENDIX A: Themes

The following themes are distilled from the annotated taped transcript. Where appropriate the themes are compared or contrasted with similar themes arising in the preceding two learning histories.

Theme	Description
Themes arising directly from this Learning History	
Risk Altering Perceived Risk Designing out risk Risk in relation to certainty Central Government's role in underwriting risk	A central theme in this story is risk. Perceived risk is shown to be subjective. There is a theme of working actively with risk using expertise to design it out and to convert it into opportunity or to transfer the risk for example using grants for funding etc. Links to Merton data here. There, as here, suggestion is more experimentation should be enabled by Central Government underwriting risk.
Differing & Shifting agendas – serving climate change	Carbon reduction started here in response to economic drivers toward energy efficiency. Actions moved with shifting agendas. Strong theme here of having an appreciation of these different agendas.
Virtuous Cycle of Trust	Relates to risk; Where trust is high this allows innovation and freedom to act. A virtuous cycle of trust meant it continually grew as each new project was successful,
Power	Hierarchical/formal power levelled due to trust won on basis of expertise, success and competence. Links to moment in Merton LH. Also to Nott LH.
Championing	Championing common-sense solutions rather than the climate change agenda. Manifests by doing things a little differently – applying a structured stepwise approach to implementing, thinking behind design ecological. Lobbying less evident than in Merton or overtly ClimateChange connected as in Nott.
Strategic Intervention	As with Nottingham a high level strategic intervention in the form of a policy was put forward to council to get buy in.
Chance, Openness & Vision	Though not a strong theme, there was a confluence of chance, openness and vision reminiscent of Nottingham and Merton in this story too. This was shown in how the chance visit to Europe created the conditions for this innovation. There's an implicit contextual opportunity in the history which refers to the aging stock of coal-boilers

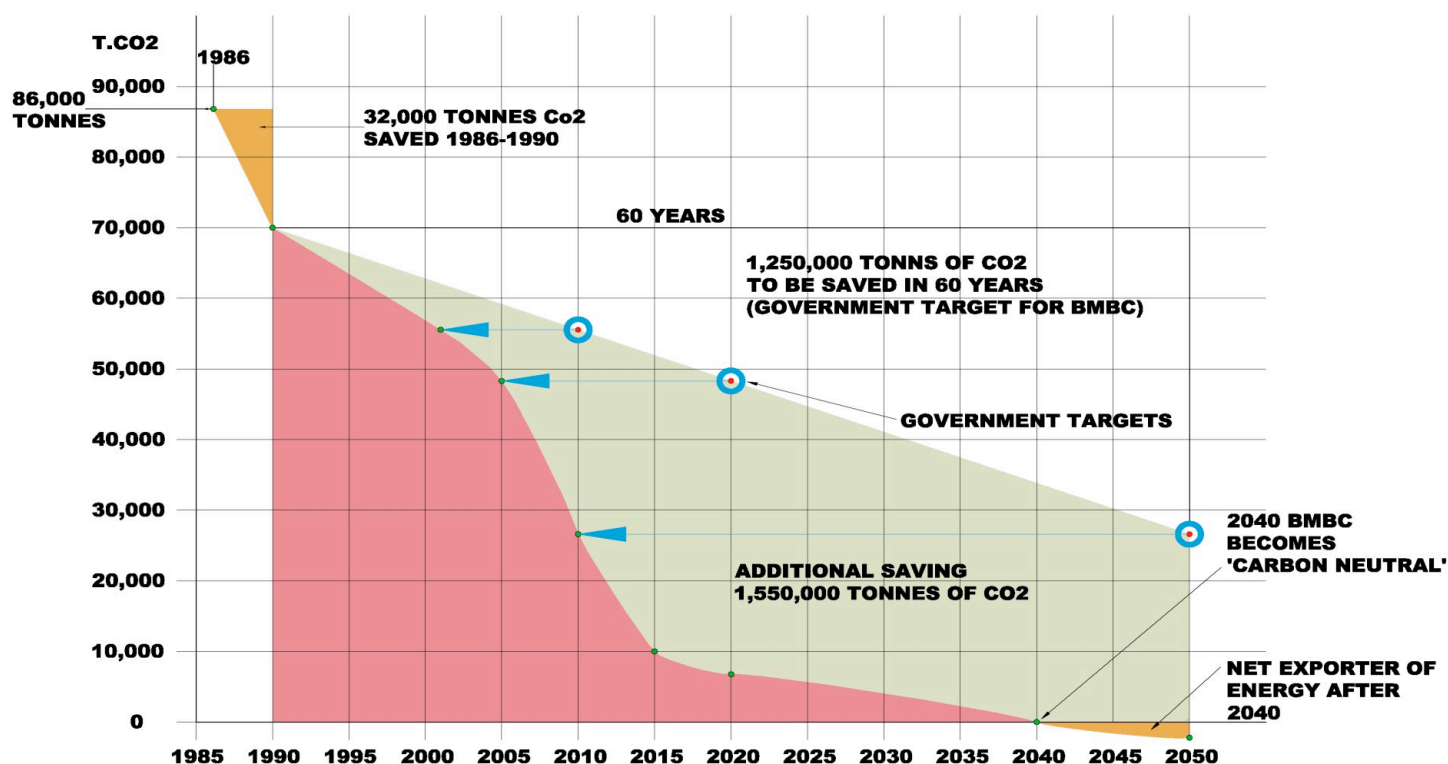
	opening a window of opportunity. This was particular to this area, which has a strong background of coal.
Technology-in-use model	Here technology-in-use and in relation to people, users, engineers, society was always considered rather than technology as a standalone. This played a strong role in the successes of the project.
Knowledge and ‘knowing exactly what to do’ Abstracting at just the right time. Translating	A theme from other learning histories too. Dick knew pretty much exactly what to do and was in a position to do it. The breadth and scope of his knowledge played a major role and the ability to abstract appropriately and translate knowledge between constituencies a key theme (e.g. business case to council, specs for energy management etc).
Stepwise, Structured and Holistic approach to Carbon Reduction	Links to other themes of knowledge and technology. This wasn’t about technology itself but rather a broadbased, step-by-step approach to carbon reduction. By working out what was wanted and then working out how to get there. Links strongly to hearsay accounts of Woking.
‘It’s simple’ / ‘Obvious’ theme	Strong theme in the interview that it was straightforward and easy. With that came a strong sense of empowerment.
Common Sense and Pragmatism	Relates to previous point. Old-fashioned common sense came up time and again including being attentive to user sensibilities and the long-term view.
Relationship between principle and particular - Planning vs. Delivery - Role of Strategies as leverage. - Role of planning as ‘structured design’	Relates to theme on knowledge and abstracting between levels. There was an interesting play between strategy and execution. Strategy served as a plan but also a mental ‘troubleshoot’. Execution fed further strategies. Role of Biomass Implementation Policy echoes of themes in the Nottingham LH.
Finance	Gaining funding not fore-grounded as an issue here. Yet in other authorities this is perceived to be a major barrier. Funding, grants and accounting across depts managed apparently easily
Timing – near & far view	Recurrent theme of timing and putting short-term plans in place whilst always keeping an eye open for the longer term (Whole Life Costing, ESCO, pellets envisaged from start etc.)
Creation of reputation and story	Fame and success spread, not actively, but through awards, visits and ‘showing’ rather than telling.

	David Miliband likened it to ‘the new Woking’. Start of a myth around Barnsley being created. Contrasts to Merton where protagonists directly involved in reputation building.
Coalition Working	Plenty of this across the board in this learning history though more ‘task’ oriented than the more ‘relational’ networks described in the Merton LH.
Heroic/Post Heroic	Less evidence here of the achievements being spread across many different actors/agencies as in post-heroic leadership models and was more evident in other LH accounts.
Systems vs. Causal Thinking	More emphasis in this account on linear cause and effect structured design though random contingencies weren’t ignored but factored in. Notable by how this worked. Interesting relationship between ecological design and linear planning.
Themes from other Learning Histories – Less Strong Here	
Relationship with Central Government	Fewer direct influences mentioned here apart from the government targets on carbon.
Institutional Forces – Copying, mimicking and competing with other local authorities/projects.	Institutional forces appeared weak here. Not many influences mentioned from other Local Authorities or projects elsewhere. Similarly no active desire to gain/seek influence elsewhere. Though local demonstration is starting to have an impact. Also increasingly people visiting from further afield in the UK and abroad. Those who wish to come and learn from Barnsley made very welcome.

Table 1 List of themes.

APPENDIX B: Trajectory of Carbon Reduction in Barnsley²⁵

BMBC'S NATIONAL LEAD IN CARBON REDUCTION STRATEGY



²⁵ reproduced with permission from Dick Bradford.

APPENDIX C: Whole-life costing of a biomass boiler²⁶

FINANCIAL CASE - WESTGATE PLAZA ONE

FUEL	CAPITAL COST	ANNUAL FUEL USE	UNIT COST	ANNUAL FUEL COST	ANNUAL CCL	25 YEAR COST
WOOD	£ 150,000	350 TONNES	35 £/TONNE	£ 12,000	NIL	£ 450,000
NATURAL GAS	£ 18,000	1,400 MWh	3.25 p/KWh	£ 45,000	£ 2,100	£ 1,208,000

↑
USUAL INVESTMENT
DECISION MAKING POINT

↑
'LIFETIME COST' REVERSES
INITIAL DECISION

²⁶ reproduced with permission from Dick Bradford.

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