

Southampton District Energy Scheme

A story of collaboration and steady ambition

A Learning History

Issue VWS -Workshop

*Nr. 5 in a series of learning histories on the
subject of “Innovation for Carbon Reduction” in
or connected with Local Authorities.*

January 2008

A jointly told tale

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Based on the perspectives and recollections of

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Mike Smith (Utilicom)

**With added perspectives from
Simon Woodward (Utilicom)**

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_v5	January 2008	First draft sent to Mike & Bill for checking
Draft_v6	1 st Feb 2008	Updates from Bill
Draft_v7	12 th Feb 2008	Updates from Mike
Draft v7.4	15 th Feb 2008	Perspective from SW
Issue VWS	16 th Feb	First Issue – 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 organization 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 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, Southampton’s reduction in carbon through the development of its district energy scheme, 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 (Bill/Mike), 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 in these learning histories are lightly added and offered as an aid to reflection on the piece. A reader may wish to skip them if they break up the narrative. In places where a theory seems relevant, this might be suggested and illustrated. These are very provisional links relating to the theoretical territory that

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.

the researcher has been covering. In the next stage of the research some of these links will be developed more fully.

Themes at the end of the learning history are summarised. These refer directly to themes annotated on the transcript. Some links to other learning histories might be mentioned. Again this will be more fully worked at the next stage of the research where common themes will be identified both in workshop setting and analytically by the researcher.

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 how the learning history came 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.

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Introduction

Every 6 weeks or so the joint technical team from Southampton City Council (SCC) and from the French energy services company Utilicom meet. Together they pore over a large A0 printout that shows a plan of the city with red lines linking several buildings and the start too of a network of blue lines.

The red lines represent some 11 kilometres of underground well-insulated pipes that supply heating to over 40 varied sites. These sites include private and social housing, commercial offices and retail outlets, civic buildings, a hospital and hotels.



Figure 1: Part of Southampton map of district energy network (Shown with permission SCC and Utilicom)

What is District Energy?

District energy is where energy is supplied from one central source to multiple commercial and/or residential dwellings. The energy supplied is usually in the form of heat, but sometimes cooling and electricity are distributed as well. The energy supplied can come from multiple energy sources ranging from conventional boilers through to solar or geothermal sources. High levels of energy efficiency can be achieved when the heat used is a byproduct of an industrial process or from electricity generation. In Southampton several combined heat and power generators (CHP) are integrated with the system producing heat in the most energy efficient way and generating electricity. The heat is then circulated as hot water through pipework to the buildings where it can fulfil hot water as well as space heating needs. Using vapour compressors and absorption chillers, cooling can also be provided in much the same way by circulating chilled water through cooling pipes. Schemes can range in scale from one block of flats (more likely to be termed 'community energy') to larger schemes where several buildings over several kilometres are connected over a district.

In the region of 12% of this heat comes from hot water pumped from a geothermal well in the city. The rest comes from highly efficient dual-fuel (gas/oil²) combined heat and power generators. Conventional boilers are connected too acting as backup for unforeseen breakdowns or peaks in demand. The blue lines represent the chilling mains that are also now in place.

The heating (and cooling) scheme has been steadily developing since the mid-80s and now saves customers some £350,000³ in annual energy costs and is estimated to reduce carbon emissions by some 11,000⁴ tonnes each year. Those connected to the scheme enjoy reduced capital⁵ and running costs⁶ compared with conventional systems⁷.

Most importantly the trend looks set to continue. Looking at the map the team discuss the dotted lines that represent pipework to support some 40 further future connections. 2008 will be the 21st anniversary of the scheme and a celebration is being planned. This will be an opportunity to mark the achievements to date here but will also help to increase the profile of the scheme which in turn helps grow and develop the business. Commercial viability is central to what is being done here. And this has paid off. Utilicom run a profitable business and currently the profit share from the scheme generates between £10,000 - £15,000 annual income for the council which is then reinvested into more carbon saving projects.

² They can also run off diesel and trials have been run with vegetable oil.

³ Source: Energy Saving Trust case study, October 2007.

⁴ This figure represents the total CO₂ emissions saved by the scheme, not just those on the council's own estate.

⁵ Quoted as between 15-25% depending on proximity to scheme

⁶ Quoted as between 10-15%

⁷ Source: IEA District Heating and Cooling System. [http://www.iea-dhc.org/download/KN1640 Southampton v2.pdf](http://www.iea-dhc.org/download/KN1640%20Southampton%20v2.pdf)

Southampton – an innovation?

District energy, and in particular community heating is not new, neither is CHP. However in the UK these carbon-saving technologies are not widely used. Whilst more than half⁸ of today's Swedish, Finnish, Danish, Polish and Estonian homes are connected to district heating systems only an estimated 2% of UK homes are heated in this way.⁹

This low figure is partly due to a milder climate in the UK but also reflects a turbulent history with this approach to heating. In the post-war property boom of the 60s and 70s some 500 schemes were installed largely on new housing estates and predominantly in council housing. However poor performance, inaccurate meters and the lack of individual controls led to widespread dissatisfaction among tenants. This coupled with cheap gas in the 70s meant that many council tenants lobbied successfully to have themselves disconnected from what was in every way perceived as 'poor man's heating' (Larsson 2006)¹⁰. As a result old pipework runs under many UK cities and some is still in use. Nottingham boasts the largest district heating system in the country and is run off the local waste incinerator.

The innovation at Southampton is in how it has distanced itself from this troubled past and represents the new generation of community heating in the UK. It is the largest non-waste driven scheme in the country and has been built from scratch with a strategic awareness of the importance of energy savings for the environment. It makes use of the latest technology: lagged pipes ensure just a 4% loss of heat over the entire system. Proper backup boilers and isolation rings minimise the disruption to service. Accurate meters enable fairer billing down to the individual household if necessary. And state of the art CHP engines boost the overall capability of the scheme. As important as all the technology, is the fact that the scheme is thriving with a steady uptake in connections from across the private, public and domestic sector.



Figure 2: Heat pipes being put down. Modern pipes minimise heat loss (photo: Utilicom)

⁸ 2000 figures: source Wikipedia (http://en.wikipedia.org/wiki/District_heating) accessed on 7 Jan 2008.

⁹ I haven't found a reliable source for these figures: currently drawn from a study entitled "History of Community Heating in the UK" downloaded from <http://www.energy.rochester.edu/uk/chpa/commheat/ukhist.htm> on 29/1/08

¹⁰ The term mentioned in a talk by Larsson at University of Bath, 2006. I am waiting to hear from Larsson as to the coinage of the term.

Researcher Questions

As always then the question is why did this happen here? What conditions enabled the breakthrough of a system that offers great opportunity for carbon reduction but that is culturally and institutionally not well understood in the UK? A quick response is to point to Southampton's geothermal resource. Yet the hot waters in the aquifer below Southampton make up just over a tenth of the heat in the system. What role did this resource play? Could the scheme have happened without it? And what, if anything, is stopping similar schemes be built elsewhere?


Southampton – comparisons with Woking?

There was another angle on Southampton that interested me. The scheme drew comparisons with the much acclaimed achievements at Woking. There, by using CHP to supply heat and virtual wire electricity to city centre buildings, carbon emissions through the 90s within the council's own estate had been slashed. The successes at Woking had been ascribed to the extraordinary vision and technical ability of one man (Allen Jones) together with the support and financial ability of his executive (Ray Morgan) of the time. Without them, the story went, it could never have happened and with that came the implication that Woking was not replicable – a claim that has to a degree been borne out.

Questions about Replicability

Southampton is not a replica of Woking but it does challenge the magical 'it could only have happened here' quality that comes with its iconic status.

With different people, slightly different business models and with different resources, Southampton's scheme developed at a similar time in the mid80s and attempts to do similar things in slightly different ways. There are interesting links here to innovation theory and the idea of an 'era of ferment' where, in response, to a 'disruptor' an organisational field tries to respond by producing different variations and possible designs (Anderson and Tushman 1990).



Southampton have done a similar thing to Woking – but they don't get the same kudos.....

Jane Wildblood, June 2007,
Sustainability Manager, Bath & NE
Somerset Council

How do these two variations compare? Will Southampton prove easier to replicate in the longer term and if so why? As recognition for the scheme grows in Europe and more recently in the US, the project is hardly reported at national level and not as well known in the public domain as other similar examples. Why is this? Does it matter?

From Southampton "Cityview" magazine, Issue 50, January 2008.



US Mayors share in city energy vision

Staff from Southampton City Council welcomed five US Mayors last month, who visited Southampton as part of a fact finding mission on climate change and renewable energy.

Mayors of Seattle, Berkeley, Tucson, Palo Alto and Sacramento were visiting the UK to see sustainable energy projects in action. And environment directorate staff and city leaders took the opportunity to show off Southampton's green credentials.

Southampton has recently been

recognised by Greenpeace as 'a true pioneer of sustainable energy' with many of its landmark buildings (including the Civic Centre, the De Vere Grand Harbour Hotel, West Quay shopping centre and the Royal South Hants Hospital) part-heated and powered by geothermal energy.

Southampton Geothermal Heating Company, set up by the council and Utilicom in 1986, uses geothermal springs under the city to provide cheap, sustainable and environmentally friendly energy.

Downloaded on 4 January 2008

http://www.southampton.gov.uk/Images/CVJan1-3_tcm46-194569.pdf

Researcher Visits

In October 2007 I travelled to Southampton to explore some of these questions with Bill Clark from Southampton City Council. Bill had joined the council¹¹ some 26



Figure 3: Bill Clark, Sustainability Policy Manager, Southampton City Council

years ago as a landscape architect. He had first played a key role in the city's successful Greenways programme which sought via the planning framework to safeguard the local open space and environment. In the mid 80's Bill first got involved with the geothermal heat scheme that was being spearheaded by the council's then Director of Finance, Mike Smith. Twenty years later, on Mike's departure (in 2006), he had taken over the running and promotion of it. The interview with Bill gave a great insight not only into how the scheme had grown but also into the subtlety of how the environment team and its agenda at Southampton had grown with it. The scheme was an important part but a part nonetheless of a wider set of initiatives on sustainability that stretched right back in time

and that had ambitious plans for the future.

What was missing though was a description of the very beginning. How had the partnership with Utilicom been brokered? How had the government been persuaded to dig a second well in Southampton? Answers to these questions constituted a vital part of the story and in January 2008, I met with Mike Smith to hear more about the early history of the scheme. Mike had been with Southampton council for over 30 years. An accountant by training he had held several high level positions at Southampton council including that of Financial Director in the 80s. In 2006 he had joined Utilicom as commercial director, a move that was placing him uniquely to bring key elements of Southampton's pioneering scheme to other Local Authorities.



Figure 4: Mike Smith, Commercial Director, Utilicom

¹¹ Southampton City Council became a Unitary local authority in 1997

Quotes from both interviewees are spread through this learning history and initialled with (BC) or (MS) to identify words quoted from Bill and Mike respectively.

The resultant learning history hopes through the narrative to address some of the starting questions about Southampton. It seeks too to explore more generally what are the qualities that enable innovations like these to happen. Where appropriate comparisons with other learning histories are made.

As it is a learning history there is a tension between information and inspiration. Whilst technical details, figures and descriptions are essential, they can dull the reader's engagement. So they are included but are not foregrounded here. There are some excellent case studies of Southampton which I have drawn on heavily but do not seek to rehash here (Greenpeace; IEA-DHP; Energy Savings Trust 2007)). The reader is invited to complement the storied account presented here with these studies.

Phase 1: The First Well

When: Late 1970s

Where: Marchwood Power Station – Southampton Water

What: A well is drilled.

Who: Mike Smith – Director of Finance, Southampton District Council
Geoff Earle – Southampton City Architect

Concerned about energy supply and security during the fuel crisis in the 70s, the Department of Energy set about digging four wells in the UK. Their purpose was to investigate the potential of deep local geothermal aquifers. One of these was at Marchwood Power Station¹², across the estuary from Southampton city.

The well was total serendipity (BC)

Theme: This all started driven by the energy security agenda.

The city architect, Geoff Earle and finance director of the council, Mike Smith were keen to understand what the government was doing. They had heard that there was talk too of a second well in the city being dug. Together they headed out to Marchwood to have a look. The well there demonstrated that below Southampton, buried deep in the Triassic sandstone, lay an aquifer of hot water¹³. The water would be used at the power station, but it clearly had a wider potential as a heat source.

I was looking at it purely as an accountant: this sounds expensive and a bit risky, I'd better keep an eye on this, which I did (MS)

The original impetus behind the project however started to fade. The power station closed down and the well was not used. And with cheap gas allaying original fears about energy supplies, earlier plans to use the water in any further developments such as Southampton were about to be shelved by the government. As far as they were concerned the well explorations were over.

¹² The other wells were near Grimsby, Belfast and in the Southwest. The southwest well was a 'hot-rock' which is much harder to exploit.

¹³ Water temperature is 74 degrees Celsius

Evermore convinced of the geothermal potential, Mike wasn't ready to let it go just yet. He set about persuading the Department of Energy to go ahead and drill the second well in Southampton and to test its potential to heat the planned redevelopment of the city centre at West Quay.

And it took a lot of convincing. (MS)



So that energy security agenda of 30 years ago has come full circle again and is now joined by climate change. I wonder how what we are doing now will fit with agendas in 30 years time?

Phase 2: The 'Greening' of Southampton: Political Champions

When: 1980s

Where: Southampton County Council

What: Political championing of 'green issues'

Who:

Norman Best, Conservative Leader of the Council (until 1984)

Alan Whitehead, Labour Leader of the Council (1984 -1996)

Baroness Diana Maddock, Liberal Councillor (1984-1993)

Officers at the Council: Mike Smith, Bill Clark and others.

Mike's growing interest in the environmental potential of Southampton's geothermal resource mirrored an increasing awareness at the council of the importance of environmental issues. Through the 80s there were some green-minded politicians in key positions at the council. The 'greenways' approach to safeguarding and planning green space in the city in which Bill had been involved in the early 80s had won recognition nationally and this had encouraged politicians to continue to pursue green credentials for the city.

In 1984 a change of administration saw a new Labour leader just as keen as his Tory predecessor to build on these credentials. By the mid-80s an environment forum had been set up to establish links and involvement with the local community. So it was that by the early 90s when Agenda 21¹⁴ started to put sustainability on the agenda of councils across the country, Southampton was well ahead of the game.

We had a very strong leader of the council who was very keen on the environment as well. There was local political will and local experts willing to move in directions that the politicians wished to move in..(BC)

¹⁴ Unveiled at the Rio Earth Summit in 1992, Agenda 21 set out a comprehensive action plan for global, national and local government agencies and organisations to address sustainability

Theme: Championing of the green agenda by key politicians and officers over a long period helped build capacity (links to Nottingham and Kirklees).

So these members were driven by their own values...? (R)

Yes it was their own values coming through (BC)

Significantly these champions were drawn from across the three political parties a factor that was carefully acknowledged and that would prove significant in maintaining cross-party support in the years to come

Theme: Cross-party support

RR

Was this a hidden piece of luck that there was a champion from each party? The luck was capitalised upon by involving them and crediting them.

Phase 3: The Second Well

When: Early 80s

Where: Southampton City Centre

What: Drilling and exploration of the second well

Who:

Mike Smith

Norman Best – Leader of the Council

Geologists – National Geological Survey

The political support at Southampton was vital in helping Mike lobby the Department of Energy to fund the second well. Eventually they agreed. A production well would be drilled with a view to providing heat to the forthcoming city centre development.

Norman used to come up to the department of energy with me to negotiate and I can remember being there quite late at night negotiating with them (MS)



Figure 5: An interesting juxtaposition? The Well cap in the Toys'r'us carpark. (Photo: courtesy SCC/Utilicom)

They dug this pit. ...next to where the rig was going to be, and that evening it filled up with water so they brought a pump in and pumped it out, and the next morning it was, it filled up again and it took them two days to realise that every time the tide came in they were effectively pumping the Solent as the ground water level was so high!

RR

The cool accountant's eye seems necessary so as not to be daunted by the sheer scale of a scheme like this.

With the well drilled, geologists were brought in to check its commercial viability.

Their tests revealed a bounded, wedge-shaped aquifer that would take increasing energy to pump. In short, their assessment said it would not be viable in the long term and that it wouldn't support a large scheme.

Were you gutted at this point? (R)

Oh we were and we'd put in a lot of time and effort and I must admit I'd changed from a sort of cynical and sceptical accountant to a very enthusiastic environmentalist (MS)

The Department of Energy no longer saw commercial value in the well and prepared to cap it off. At Southampton Council, Mike and others didn't want to let go so quickly. Could it be used for a smaller scheme? Perhaps. But they were now on their own. Though the Department of Energy said they could use the well, there would be no further financial backing.

Though the significant cost of drilling the well had been borne by the government it was not yet a usable resource. Even with reduced ambitions for the scheme, further testing and forecasts of the life of the well needed to be carried out and costs for this ran to the tune of £600K-£800K. It was going to be expensive.



But it doesn't seem to have been only a cool accountant's eye that was driving the project on at this stage? Qualities of passion, tenacity and faith in the face of a lot of uncertainty were surely needed to continue at this point?

At that time [] I don't think we understood the potential. It's only subsequently that we saw [it] (MS)

Theme: Working with a shifting vision of what was achievable

Scene 4: A good cup of coffee

When: Early 80s

Where: Florence - Italy

What: Geothermal conference

Who: Mike Smith

A Greek delegate

An Italian delegate

It was still the early 80s. Mike was invited to speak at an EU geothermal seminar in Italy about their experiences in Southampton. There he talked about the original vision they had for the scheme.

During the conference, over a cup of coffee, he chatted casually with a Greek and an Italian delegate about the Southampton project describing the situation they were in with the second well. He asked them about the possibility of getting EU funds for the testing. As it happened the question was well-placed. His fellow coffee-drinkers were well connected in the EU and were optimistic about the possibility of getting funding. They invited him to come and explore it further with them in Brussels.

Theme: A moment of serendipity – resonant with the ‘cat’ moment in the Merton case.



The chance moment connects an ongoing search with the means to realise an ongoing vision. Neither the search nor the vision is in any way chancy.

So that's what I did, this was just over a cup of coffee and I went across to Brussels and from there they very kindly agreed to find funds to test the well (MS)

Theme: Networks leading to important informal conversations.

In Brussels, the EU funding was successfully agreed to test and make the well exploitable. They were now on uncharted territory - there was no experience in the UK for a project like this. A European firm with experience in oil-drilling technology were brought in. A pump normally used for extracting carbon-rich oil was installed and would pump up the hot carbon-neutral water.

Theme: New skills built on knowledge in other areas

Conversation as Innovation – Light links to theory

In the literature conversations have been described in places as being the action of change and innovation rather than its by-product. Organisational change theorists, Ford and Ford identify four distinct kind of conversation that drive can drive change in an organisation (Ford and Ford 1995). In their interpretation of change is linear and so the conversations follow a process from the ‘initiating’ conversation, through ‘understanding’, ‘performative’ conversations and ending in ‘closure’. Where does the inquiring, informal conversation fit?

Complexity theorists help by placing high importance on the role of the chance or the random conversation in enabling innovation to take place.

Innovation consultant and writer Jose Fonseca cautions that innovation cannot be seen as “*the realisation of a rationally chosen goal*”, but rather as a process whereby there is “*new meaning emerging in ordinary, everyday work conversations*”.(Fonseca 2002)

And complexity theorist Patricia Shaw has written of the value of ‘*just talking*’ in developing new ideas. Describing a client meeting where ideas and creativity started to flow, she illustrates what that means:

“The clarity about what we are doing and our respective roles in the conversation begins to dissolve. This is rather unsettling. No longer are we discussing a proposed future initiative, we are very much in the midst of things, talking about what kind of sense we can make of our experience. That quality of our communication changes (Shaw 2002)”

Pivotal informal conversations, of the nature described above or in the other learning histories are more likely to have such a quality.

Phase 5: Forging a partnership: sharing risk, building trust

When: Early 80s -1987

Where: Southampton, Paris

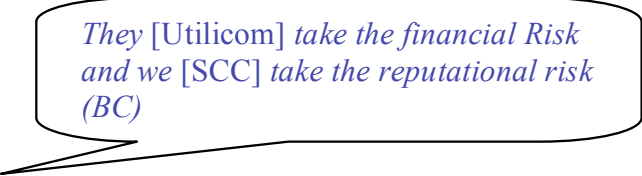
What: Creating a partnership with Utilicom

Who: Mike Smith

Jacqui Dixon – Council’s Head of Legal Services

Charles Maillard – IDEX, and board director of Utilicom

MR, JW – Southampton Council



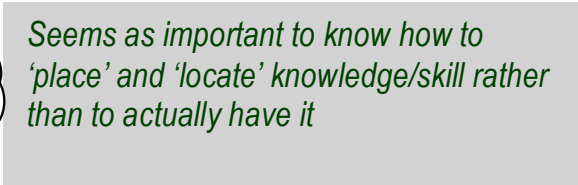
They [Utilicom] take the financial Risk and we [SCC] take the reputational risk (BC)

Finding the money to test the well hadn’t been the only challenge facing Mike. There was also the question of having the technical and operational skills to exploit it should the tests prove it to be viable. These were responsibilities that Mike was keen to transfer, along with the financial risk, to a private sector partner. There was no such experience in the UK. However there was in Europe. Taking the pragmatic view that: *‘if you haven’t got the expertise you buy it in – you’re always looking at risk transfer’*. Mike started talks in the early 80s with a French company Utilicom¹⁵ who had already put a number of district energy schemes together in Europe in the 70s.

Theme: Brokering Knowledge



RR



Seems as important to know how to ‘place’ and ‘locate’ knowledge/skill rather than to actually have it

One of these schemes at Ville le Mee sur Seine¹⁶ was already making use of the warm geothermal waters lying below Paris.

A good working relationship started to be developed with Utilicom. The then, IDEX director, Charles Maillard could see commercial potential despite the real financial risks and, with his support, a trusting, collaborative way of working was starting to be developed.

Theme: Trust & collaboration

As the tests on the well verified its potential, Mike and the council’s lawyer of the time, Jacqui Dixon, set about drawing up an agreement as to how the council and Utilicom might do business together. Finding a company who not only had the required experience but who were also prepared to trust the council to help them develop the scheme was, as Mike put it, *‘a real stroke of luck’*.

Theme: Luck

¹⁵ Utilicom are part of the French energy group IDEX

¹⁶ A scheme similar in scale to Southampton today: 9MW CHP, 2.4MW Geothermal and 12.4 km of heating mains.

Naturally Utilicom would be commercially driven, aiming to supply heat profitably across the city and not just to the council. In terms of digging the roads up,



This echoes the effort in Barnsley in getting it all to fit together and getting the business case to stack up alongside any formal agreement or strategy

they needed to be a 'statutory undertaker' like any other utility. However the council would do all they could to support the scheme. They'd take heat wherever possible for their own buildings, provide the land for the heat station and actively encourage others to connect. Financially this was a departure: capital costs of infrastructure together with returns in terms of energy savings needed to be fairly apportioned and reflected in new billing models and connection fees. A policy of open-book accounting and an agreement to profit share with the Council embodied financially the spirit of trust that the partnership espoused.

Theme: Financial and Legal innovation accompanying a technological innovation.

Of crucial importance was how the lawyer Jacqui approached the agreement. It was short, but robust and to the point. Whilst it protected both sides, Jacqui

She didn't behave traditionally as I find lawyers normally do, having a big complicated agreement, she understood immediately what it was we were trying to do and what the risks were (MS).

designed it to be "*non-adversarial*". The key principle was that the partnership would be founded on co-operation and trust. Any legal agreement would underpin rather than drive the relationship.

Theme: Trust underpinning working relationships

The best contracts go in the drawer and you don't refer to them because it's the people that make them work. It really is

The resulting agreement captured the spirit of what the partners intended to build together and has "*stood the test of time*". Over 20 years it was barely referred to and it recently formed the basis for a renewed 25 years of partnership in 2005.¹⁷

Theme: Risk Transfer: With the partnership risk was transferred to where it was best placed.

¹⁷ Jacqui's work did not finish with the co-operation agreement she also drafted a portfolio of other related agreements including The Councils Heat Service Agreement, and wayleaves and licences for laying distribution mains

With the partnership stacking up legally and financially, support and confidence within the council was high.

Finally, to show that what was being suggested wasn't 'some pie in the sky' members and officers from the council were brought to Paris to see for themselves a working system.

The two people [who] usually can kill schemes [are] an accountant and a lawyer. So you've got me on the one side sort of the champion and on the other side Jacqui who really grasped this



The perception of risk and level of fear at the council seems to have been low: there were high levels of trust in two of the key champions who were not only well placed in the organisation, but had expertise in the very areas (legal and finance) that normally point out risks and problems with new schemes.

Theme: Building a sense of joint-ownership and trust among the key stakeholders in the project's risks

In 1987 the agreement was signed. And by carefully ascribing credit to champions within each political party,

cross-party support was now assured. With a 20-year legal agreement, energy in debating it would be misplaced. It was now a matter of continuing to communicate about it, explaining it and offering any new members and officers a share in its success.

I used to make a point of saying, this Conservative member, this Liberal Democrat member, this Labour member ... So they could all take some kudos from it... After every election we'd have a seminar for members and bring them down here [to the heat station] (MS)

**Theme:
Sharing Kudos
and reward**



In addition to its legal purpose, the agreement served also as a vehicle for action – a conversation stopper – or a way of changing the conversation from what to do, to how we'll do it. Links to Nottingham Declaration and Barnsley's implementation plan

A company wholly owned by Utilicom – the Southampton Geothermal Heating Company (SGHC) – was formed under which to run the scheme. A 'joint co-operation' team chaired by Mike was put in place with representatives from the council and Utilicom. This inter-disciplinary team included, among others, a Civil Engineer (JW) and a Planner (GR) from the council and from Utilicom, Charles Maillard all of whom came on board and drove

It was funny because the way this team came together it's one of the best teams that I've managed; they seem to identify with the project ... it was really "how can we take this forward?" (MS)

the scheme forward with enthusiasm. From the start there was a shared belief in the scheme within this team and this was reflected in how they worked together with a sense of shared ownership. A vibrant identity soon started to emerge that matched the enthusiasm. Bright blue and red colours were chosen for the heat station and a competition was held to design the company logo. It was an exciting project – one of the first of its kind in the UK. And echoing the principles of the legal agreement, the atmosphere was again collaborative and non-adversarial.

Theme: Coalition working: group purpose transcending ‘role’



Why was this team so functional? Was it the group of people involved? No doubt. But there was too the excitement and the spirit of co-operation that ran right through the project and it appears to have been catching. That would also have helped get people out of their compartments.

Phase 6: The Heat Station and the first connection

When: 1986

Where: Southampton

What: The Heat Station goes into operation.



Figure 6: The Red and Blue heat station. Now surrounded by new development. (Photo: SCC/Utilicom)

The site – now it's in a key area – [but] this was before anything was built: it's got a chimney – we did a VOXPOP of people in the area and asked what they thought it was – most people thought it was a warehouse! (BC)

With a commercial partner on board things moved quickly. In 1986 the heat station was built just a few 100 metres from the well.

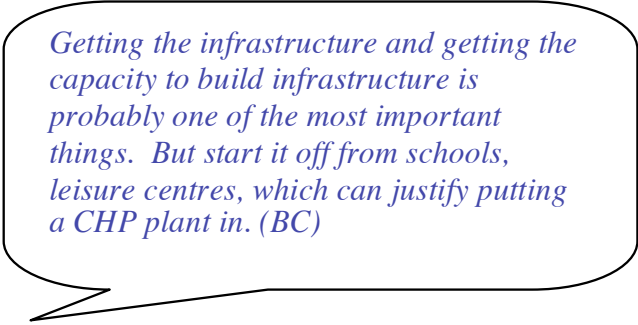


Figure 7: Mike with the titanium plate heat exchanger he bought at a bargain from the Marchwood well

Ignorance is bliss because I hadn't a clue how much these things were worth. And I think I offered them something like about £500 I didn't know how big it was, I'd never seen it, I just knew that they'd got this heat exchanger and we needed one. And they said okay. I think it cost us more than that to transport it and to store it! (MS)

Briney water pumped from the well was passed through a heat exchanger and the resulting clean warm water, together with hot water generated from the first 1MW CHP engine was pumped through pipes to supply heat to the first customer of the scheme. Located just over a kilometre away – that customer was the Civic Centre.

With that first connection, a basis of infrastructure was now in place and crucially it demonstrated that technically the system could work. Equally significant would be the second connection.



Getting the infrastructure and getting the capacity to build infrastructure is probably one of the most important things. But start it off from schools, leisure centres, which can justify putting a CHP plant in. (BC)

Theme: Stepwise approach; Start with one thing, demonstrate it works and build on it.

Phase 7: The Second Connection - ASDA

When: Late 1988

Where: Southampton

What: ASDA agree to connect

The heat station had been built on reclaimed land that was earmarked for redevelopment. It had always been the intention for the scheme to supply those new developments. It remained a challenge to win prospective developers over to that view.

ASDA, a large well-known supermarket chain, was one of the first to put in plans for development near the heat station and with that application the Council had its first opportunity to demonstrate how serious it was about the scheme.

As a new-build, the arguments for ASDA to connect were strong. Not only would they save cost-wise, but extra retail space could be won by not having a boiler room. But, as the partnership were to find in the coming years, strong arguments weren't always enough to win customers.

I wouldn't say it was easy – it is a lot easier with new build than refurb We used the planning; we just encouraged them through the planning system (BC on getting ASDA to connect)



Figure 8: ASDAs connection for heat takes much less space than a boiler room
[Photo:Utilicom/SCC]

ASDA did finally agree to connect and this was significant. It was one of the first commercial businesses in the UK to connect to district heating. Furthermore its location on the land near the heat station that was significant. It set a precedent for the developments that were to come. For the joint team it probably also marked the beginning of journey of highs and lows as they sought to entice new customers to connect to the scheme.

Is there a celebratory moment when someone says they'll connect? (R)

No well usually it's thank God for that! (BC)

RR

It'd be interesting to hear how this was experienced at ASDA and did they feel or still feel themselves ground-breaking

Phase 8: Early Connections - Learning to work with the forces of resistance

When: Late 1988 - 1997

Where: Southampton

What: Varying degrees of success with winning connections

The cost advantages of connecting to the scheme were persuasive from the start – however it was never going to be so simple. In so many ways the scheme challenged, and indeed still does challenge, ‘the way things are done’ and the response to this challenge ranges from puzzlement through to downright obstruction.

Along with all the normal fears of switching to a new technology - would it work?, would it be reliable? – ran some more deep-rooted patterns of resistance.

We have a view here, and that is that the people who specify energy systems in buildings are very reluctant to support district heating schemes because their fees are reduced....(BC)

By proposing a new way for

heat (and later cooling) to be supplied the scheme was challenging all the practices, policies and organisations that have built up around that idea of heat supply. Gone would be a boiler room but with that the need to design it.

Gone would be the need for wall-mounted electric heaters in Southampton but what if a company-wide procurement policy was ensuring cheap supply of these radiators? What then?

Theme: Professional practices block

RR

Here (unlike the example in Kirklees) multiple agendas sometimes interlock to prevent things happening.

Similarly the role of the Council in promoting the scheme was also challenging the common view of ‘how we do development’. A fine balance needed to be struck

The general view is.... what the hell is the Local Authority doing trying to get us to do this? We want to get this building built – why are we talking about how we’re going to heat it and put energy into it. (BC)

between encouraging and forcing connection. In those early days, there was little leverage to be drawn on. Connection to the scheme was presented to developers as much as a “*moral obligation*”

(MS) to the community and the city as it was a financially advantageous proposition.

Light links to theory – Decision Theory

Much of decision theory (and indeed classical economics) is based on a 'rational' model of the human being. This model assumes that, on being faced with information, a human will digest it and make an appropriate decision. This model has been refuted as over and over again examples of human's displaying 'bounded rationality' (Simon 1957) surface. Many such examples abound in the area of sustainability where the rational model would suggest making energy savings, but still people don't do it. It is illustrated here too quite clearly, where people found it difficult to sign up to this new system. An explanation of 'bounded rationality' is linked to our faulty view of human being as 'rational'. Far from being information processing machines, David Snowden argues that humans are 'pattern based intelligences' – decisions are made on past experience that we hold in our memory (Snowden 2006). After extensive research on how fire-fighters make decisions under pressure, Gary Klein concluded that, at the moment of decision, a human being doesn't consider all possibilities simultaneously, rather he/she will compare one option against an internal pattern and decide appropriately (Klein 1998). When something is new, then it is harder to decide in its favours and responses of fear can overwhelm a sense of any logical argument.

There were some successes and some failures in this time. Negotiation was shared between Utilicom and the council. It was a delicate process and sometimes protracted. relationships needed to be carefully built and it was a blow when despite

You get disappointed when you lose, well --- I mentioned B. Hotel - there've been one or two like that where I've almost taken it personally because you invest so much time and effort in it.. (MS)

everything a customer didn't carry through the connection. In the early days Mike spent a lot of time trying to persuade a housing developer A. Homes¹⁸ to connect but they wouldn't do it. With a hotel, B. Hotel, negotiations reached the final stage only to have them renege on the deal

at the last moment.

But there were plenty of successes too. The BBC connected in 1990. Familiar with district heating, French hotels IBIS and Novotel connected without a murmur a few years later.

RR

French culturally more familiar with district energy perhaps?

Theme: Capital vs. whole life cycle costings act as blocker

When have you had sleepless nights?

Failing to get major developers on board – and wondering why. You make the case -its stacks up in capital costs terms, it stacks up in revenue cost terms, particularly the volume house builders – very difficult. But one of them has said to me 'I'm not interested about what it costs someone to live in my house I want to sell it. (BC)

RR

Links to findings in Barnsley and Kirklees that compares private and social sector housing regime shows why latter more likely to innovate for sustainable building

¹⁸ Name changed

Scene 9: A cool connection

When: 1994

Where: Southampton – The De Vere Grand Hotel

What: A prestigious hotel connects to heating and chilling.

With each new connection the strength of the scheme grew too. In 1994 the new five star De Vere Grand Harbour hotel agreed not only to connect to the heat system, but after negotiations with Utilicom they agreed to avail of chilling that was made possible by an absorption chiller¹⁹ at the heat station. A further 600m of chilling mains were laid down to the hotel, and the connection fee was offset against future energy savings.

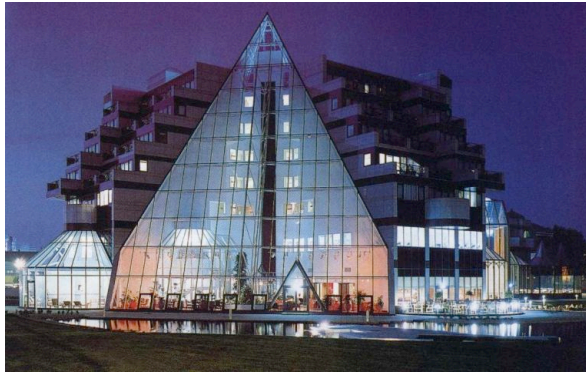


Figure 9 De Vere Grand Harbour Hotel (courtesy: Utilicom)

Theme: trust. Reflected in flexible financial billing models.

The scheme could now demonstrate capability in chilling as well as heating and the impressive façade of the luxury hotel could dispatch any lingering associations between this district energy scheme and ‘poor man’s heating’ (Larsson 2006). The chilling network was extended a few years later when the BBC, who had long been using the heating, asked for a connection for cooling. Their own system had broken down.

¹⁹ Uses heat to produce chilled water. Has great advantage of increasing the running hours of the CHP engines over the summer when heating systems are off.

“Poor Man’s Heating” : Links to Theory –Social Construction of Technology

There has been some interesting writing about how a technology is viewed by society and how its meaning and use can shift over time. Elizabeth Shove, a sociologist from Lancaster, has tracked how social views on getting wet (in the middle ages associated with danger) and available technologies (electricity, pumps) have changed over time leading us today to the water intensive practice of daily showering (Shove 2003). Pinch and Bijker have described the social processes that led to what was just one of many options becoming the prototype for the bicycle as we know it today (Pinch and Bijker 1984). And Frank Geels has described the shift from horse-drawn carriages to fossil-fuel cars not as anything obvious but as a melee of social and technological changes involving, among others, our understanding of highways, attitudes to health and horse-manure, the use of electrically propelled trams and young gentlemen’s desire to get out to the country (Geels 2005). A less dramatic perhaps, but nonetheless important shift is described in this case study where the social understandings of a particular kind of technology, in this case community heating are changing.

Scene 10: Lightbulb moment: Geothermal's role, Standalone schemes

When: mid -1990s

Where: Southampton

What: Changing what it's about & Holyrood

The understanding the scheme itself was gradually shifting with each new connection. It was, and still is marketed as a geothermal scheme. But in the early days the geothermal resource was considered to be its central point. Thinking that way about it was in some ways limiting. There was believed to be about 20-25 years worth of hot water in the aquifer – it was a finite resource²⁰.

As the network grew, so too did the familiarity with combined heat and power as a way to efficiently enhance the heating supply.. It was around this time that Mike describes an important shift in thinking as they came to realise that it was the network and not the geothermal that was the key point. This realisation was significant. It reconnected the team back to their original ambition – that of a larger district energy scheme around Southampton and in practical terms it released the team to think more imaginatively about potential sites for community energy.

That was one of the lightbulb moments and you think, yes it's the network really that's important, after that you can plug in whatever energy sources you've got really. And so it was then we realised that our dream of having a large scheme actually, we could do this by adding CHP even though the geothermal resource was relatively small (MS)



Figure 10 Holyrood – Council housing, the first standalone CHP scheme (Photo: Utilicom/SCC)

In the short-term, for some sites, it didn't always make sense to connect all the way back to the well. One such site was the Holyrood estate where 300 council flats were in need of new heating.

So by 1997, we could demonstrate y'know... we'd put the heat station in, we'd supplied an old commercial building, that's the Civic centre, a new commercial building, which is ASDA, and existing housing, which is Holyrood (BC)

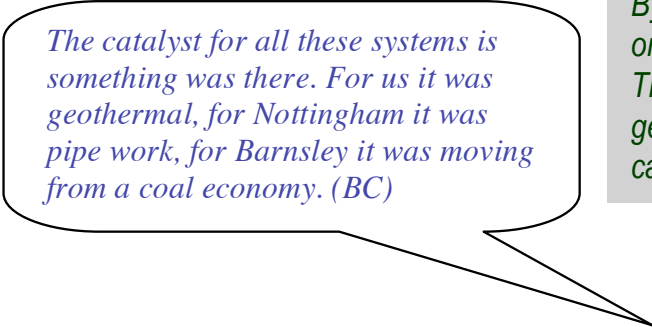
Theme: Capital stock renewal creates opportunity (links to Kirklees)

²⁰ There is no reinjection of warm water into the aquifer as is often used to prolong life. With an output of approx 1MW (2MW with a heat pump) its longevity is estimated to be 25 years.

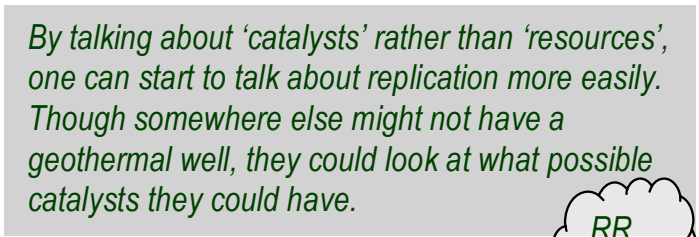
It was too far from the mains, but a small standalone CHP²¹ generator could be installed to supply small-scale community heating. Though this wasn't geothermal it offered an important opportunity to test and ultimately demonstrate that residential developments could without difficulty be heated in this way.

Theme: Stepwise approach – short loops of demonstration, validity: virtuous cycles

The geothermal energy was gradually being reshaped and understood more as a catalyst for the scheme rather than its key substance and this process has continued over time. Today Mike describes it as vital to the scheme's marketing saying: "*The geothermal, it's like the marketing expression really, it's the sizzle that sells the sausage*". Echoing similar ideas Bill talked about the Geothermal as a catalyst for the scheme and the scheme in turn being "*a catalyst for the changing agendas*" in general. For example the scheme has demonstrated that putting CHP into high energy-use complexes is a sensible starting point for any local authority looking to reduce energy and carbon costs. Though doing this requires neither geothermal water nor a district heating network, it seems that here and elsewhere some enabling condition is needed to kick-start the process.



The catalyst for all these systems is something was there. For us it was geothermal, for Nottingham it was pipe work, for Barnsley it was moving from a coal economy. (BC)



By talking about 'catalysts' rather than 'resources', one can start to talk about replication more easily. Though somewhere else might not have a geothermal well, they could look at what possible catalysts they could have.



RR

²¹ 110kW, housed in a pre-fabricated building.

More about:Re-energising the Scheme**Related Section(s):** Later Connections – extending the portfolio**Time Period:** 1996 onwards**Added by:** Simon Woodward, CEO Utilicom (via Researcher, Feb 2008)

In 1996 the scheme had reached a tipping point. With the connection of the Hospital to the scheme heat loads had increased but the installed level of sustainable energy generation plant had not. As a result of this most of the heat being supplied to consumers was being generated by conventional boilers. The scheme had never made a profit and the financial outlook was poor. I took the decision that time, when appointed as CEO to seek funding for a large scale combined heat and power generator to re-energise the scheme, dramatically reduce the carbon footprint of the energy sales and finally bring the scheme into a profitable and stable condition moving forward. Following extensive work with a number of banks and comprehensive due diligence on the scheme, funding was obtained in 1998 from the Bank of Scotland for a 5.7 MW CHP engine, coupled with a long term electricity sales contract. This expansion of the sustainable generation plant turned the scheme around and we are currently working with the Port of Southampton to sell the electricity from this generator to them when the current purchase contracts ends.

Phase 11: Later Connections – Extending the portfolio

When: 1996 – present.

Where: Southampton

What: More connections: Private Housing, The Hospital and West Quay

Who: Simon Woodward, CEO, Utilicom

The scheme was growing but was still struggling to become profitable. New connections, such as the Hospital, increased the demand for energy and this was increasingly being met with conventional boilers. At that time Simon Woodward had been appointed as Chief Executive of Utilicom. He brought to the partnership technical and business skills that proved invaluable in helping to expand the scheme. To match the demand more efficiently (and with less carbon), an enormous 5.7 MW Wartsilla CHP generator was installed at the heat station in 1998. (See Simon’s perspective opposite). More public buildings like the sports and leisure complex were connected and so too were more offices in the city centre.

Another pioneering milestone was passed in 1999 when Barratt’s homes agreed to connect a new development of over 100 luxury apartments to the scheme. “Park View” would be the first private development of its kind in the UK to have community heating. Customers would have individual heat meters in their homes, long-term contracts with the supplier (20-25 years) and index-linked guaranteed savings over time. It was an entirely new way of ‘doing heating’.²²

Theme: changing consumer practices

Not long afterwards another Barratt’s housing development of 164 private dwellings at “The Dell”, the former Southampton Football Club site, was also connected.



Figure 11 The 5.7MW Wartsilla engine being delivered so big it stopped traffic on the M25

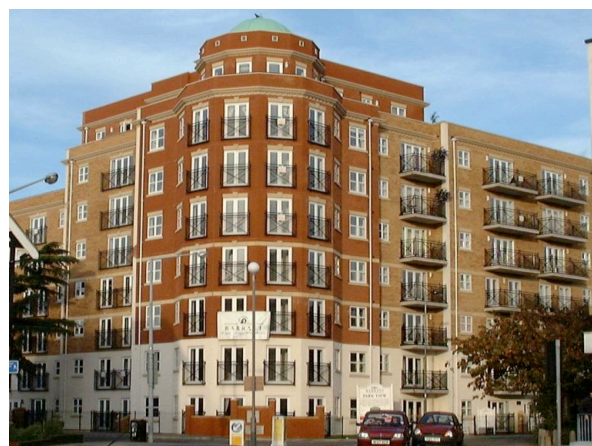


Figure 12 Parkview Flats – the first private development in the UK to connect to district heating (Photo: Utilicom/SCC)

²² Surveyed Customer feedback has been positive with 69% believing the community heating system better than the old system. There is no need for a boiler and hot water comes in via a small plate heat exchanger and has good pressure and instantly available which is popular [source: IEA study] some customers have complained about at the long-term contracts with one supplier.

By 2000, the once derelict land around the heat station had been redeveloped into a large shopping centre at West Quay. Many outlets including reputable retailers such as M&S and John Lewis agreed to connect for heat as well as cooling. Vapour compressors had been installed at the heat station and these used electricity from the CHP engines to drive a much greater capacity of chilled water²³. With this the original motivations for digging and exploring the second well had been realised but by now the scheme had outgrown those ambitions.



Figure 13 A bank of vapour compressor chillers bring the current chilling output to 8MW

More about:The West Quay Connection

Related Section(s): This section

Time Period: 2000

Added by: Simon Woodward (via Researcher, Feb 2008)

Although a number of commercial consumers had been added to our Southampton scheme up to this date, none of these were as significant as the 53 Acre West Quay Shopping Complex which was connected onto the scheme in 2000.

When I originally made the approach, despite the close proximity of our energy generation facilities to proposed site for the shopping centre, the developer IMRY (subsequently Hammerson) was extremely sceptical. I therefore decided to approach John Lewis Partnership who were to take the anchor store and with whom we had previous discussions regarding connecting the previous Southampton store. I successfully closed a 20 year energy supply agreement with this market leading retailer, which even today we use as the main reference contract for the scheme, for supplies of all heating and cooling for this anchor store. Following this I:

- Convinced IMRY to enter into contract on the strength of the contract I had concluded with John Lewis
- Then followed the same approach with the M&S anchor store

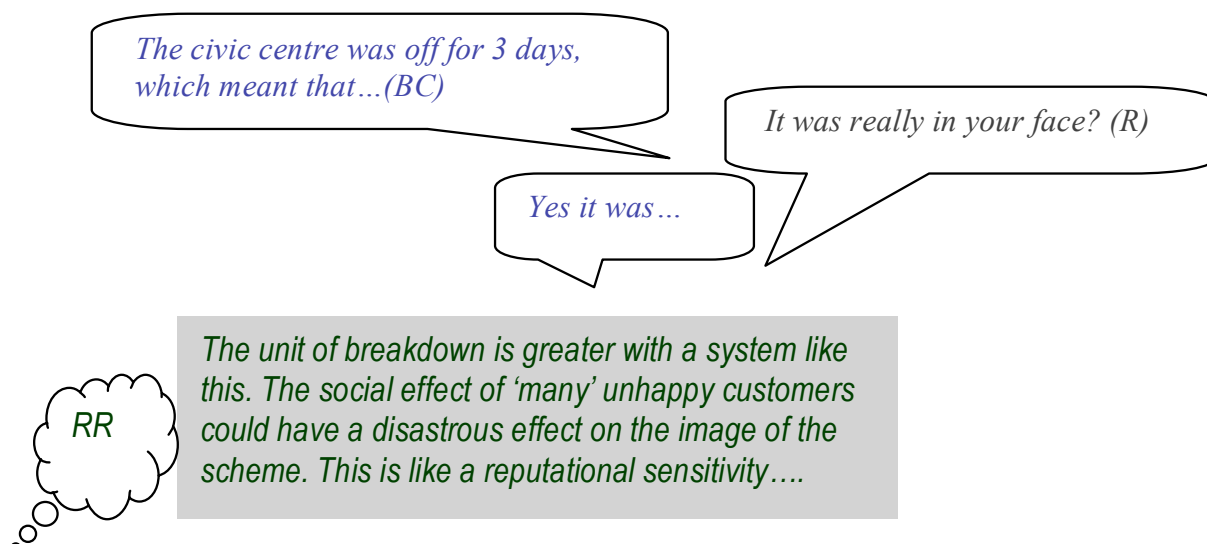
²³ These brought the chilling output to 8MW. Vapour compressors take heat as input. This means that CHP engines can be used through the summer and this greatly increases the CO2 saving from the system.

- Negotiated with IMRY in conjunction with the City Council, to ensure IMRY installed a chilled water ring main, at a cost of circa £0.5M to the Developer, at the rear of all the other shop units from which Utilicom could then sell chilled water supplies
- This connection and the Southampton scheme is to be featured as the UK's leading sustainable energy scheme in Hammerson's 2008 CSR report.

In 2002, a 725kWe CHP engine was installed at the Royal South Hants hospital to meet most of its electricity²⁴ and all of its heating demands. At the furthest point from the heat station, excess heat would be exported back into the network.

The system was proving very reliable. There were back-up boilers at the hospital and in the civic centre. In the lifetime of the scheme only 4 outages had disrupted supply. Two of these have resulted from pipes inadvertently being damaged during building works. Customers, contractors and builders have simply forgotten they were there. And in March of 2007, during a cold snap, the civic centre heating system broke down for the first time in 20 years. On investigation it transpired that it was the old 1930s cast iron pipework within the civic centre that was in need of repair, not that of the energy scheme. Customer responsibilities are different with this scheme. Isolation rings minimise the impact of these kinds of problems on the rest of the system.

Theme: A new technology requiring new user practices and responsibilities to be learnt



²⁴ 75% according to an Energy Savings Trust case study.

Phase 12: Now – Lessons Learnt and a Changing Context

When: Now – Jan 2008

Where: Southampton

What: Lessons learnt and changing context

A lot has been learnt in the past 20 years, not least about how best to encourage customers to connect. Not only are the arguments for connecting now well-rehearsed, so too is the process of marketing and communicating about it.

The team have learnt who best to approach and when. In the past they failed in negotiation with a developer team of architects and engineers only to be phoned up later when the building was built and running on electric heating. It was the managing director of the company who commissioned the building who asked:

“Why didn’t you ask you to connect to the system, because we would have done?”.

And we thought, “hang on”, “we were talking to the wrong people! (BC)

They go now directly to the top level – to the decision-makers. When there is a potential development a letter is often sent from the Council’s executive level to the managing or commercial director informing them of the scheme and of the social, environmental and economic advantages of connecting to it.

But the context is changing too. Corporate Social Responsibility (CSR) is now a function in most companies. There is a sense that, at least in some negotiations, people aren’t just looking at the bottom line. And where they are, then CSR claims can be used as leverage when actions on the ground show inconsistency of those claims.

[C. Co] were reluctant, so I looked up their website and they had all these great environmental aspirations and credentials... so I wrote to the chairman and said because of this, surely they'd like to link to the scheme, but they wouldn't, just a show sort of tokenism. (MS)

Through the 90s, Bill and others at the council have worked hard to move their leverage with developers from moral obligation into something that is now backed more formally by the planning process. Evolving the planning framework to make reference to the scheme has involved a process of continually pushing the boundaries of established practices of planning. Such a move requires learning within the organisation as well as outside of it. Inasmuch as developers have had to rethink “*how we do heating*”, so too have officers have had to rethink “*how we do planning*”. Considering the heating scheme, and, more broadly, issues connected with sustainability requires a move away from land-use planning toward spatial planning and with that comes a whole new set of skills.

Theme: New ways of working required. Inertia can act as a barrier.

As the climate change agenda gets more of a hearing, efforts to tackle it locally are increasingly being boosted by more encouraging legislation at regional and government level though things are very much in churn at the moment.²⁵ Though there is much disarray, there is no doubt that the agenda has changed completely from the days of the fuel crisis when the first well was sunk.

Theme: Shifting agenda, Shifting context – new legislation

A lot has changed then since the early days of trying to convince people to connect to the scheme as their moral duty. People now phone up to enquire about the scheme and though clients might still '*negotiate hard*' (MS), deals are now usually struck. There are many well-known names connected and the financial benefits as well as the reliability of the system have been proven.

All these changes give cause for some cautious optimism. Bill was pleased when, aware of the council's strengthening position on CHP, a recent developer restructured an application completely in order to include CHP rather than risk being refused.

When we get into that type of detail with individual applications I can see that this process is winning – we're getting there. We're actually at the point where developers are saying 'We're going to have to take this seriously but we're not quite ready for that yet' (BC)

And Mike cannot help but feel delighted when he heard that the housing developers: A. Homes have finally agreed to connect to the scheme [

There's no doubt that "*it can't happen overnight*" (BC). It requires tenacity and patience to build a scheme like the one at Southampton. Recognising that by having a long-term vision from the start can help to keep a perspective.

So after the resistance I've had with them over the years that gave me a lot of satisfaction [MS].

Some of the schemes I've been involved in, huge projects, have taken years to do and I've always regarded it as a challenge. To me it's a bit like doing a crossword or Sudoku puzzle; you persevere till you've got the solution (MS)

Theme: Maintaining a long-term focus

²⁵ E.g. New Climate Change Bill, Energy white paper, HECA act being revoked etc.

Phase 13: Future plans : Scaling up, Driving CO₂ down

When: 2008 into the Future

Where: Southampton

What: Scaling up, Driving CO₂

In 2008 the scheme will celebrate its 21st birthday with a party and is entering a new phase of maturity both in terms of scale and in capability for carbon reduction.

There are plans to extend the network to the west and eventually to add a second heat station. On the outskirts of the city, some larger private developments at Woolston and Millbrook are looking seriously to put community energy networks in their plans. Should these or similar schemes go ahead then the potential is there to scale this up to the biggest network of its kind in the UK.

R: So there's an indirect influential link of what's happening there [Millbrook] and there's a potential for scaling up...?

Oh there is – if that were built we'd be talking about a connection to this scheme at some stage. (BC)

Theme: Steady ambition

Keen to drive down emissions further, there is a move to integrate more low or zero carbon energy sources into the scheme. These include energy recovered from waste, solar energy, fuel cells and other sustainable fuel sources such as biomass. In the short-term, later this year, a 1MW woodchip Biomass boiler will come online. Agreements are currently being finalised with a supplier. Long-term there are plans to capitalise on an estimated 200,000 Tonnes of secondary wood available locally.

There is a desire too to make best use of the heat and electricity generated by the scheme. Whereas excess electricity generated is currently sold at a low price back to the grid, direct line connections using private wires to larger users are now planned. And matching the heating and cooling produced to the daytime peaks in demand is a challenge that has the team looking at various solutions for thermal storage.

We thought of using an ice rink as a thermal store for cooling ...it hasn't quite stacked up yet (BC)

RR

This section really highlights the scalability of this scheme as a result of how it was developed. Renewable energy sources are introduced later than in Woking, and virtual private wire is not currently used – though is now being planned.. This simpler base makes it more replicable perhaps?

I actually think the Woking scheme is difficult to replicate. It's very clever, I have to admire it enormously - It's the [virtual] private wire, then you've got the PV, you've got fuel cell, you've got CHP, it's really the way that it's integrated. (MS)

Comment: Ongoing Learning, Increasing Influence

At the heart of this scheme lie collaboration and openness to learning. The learning history concludes with a reflection on how these principles might relate to some of the original questions about kudos and recognition for the scheme.

Learning and Collaboration

First learning. Alongside the scheme's technical development, and as significant, is the ongoing process of learning that it has brought at all levels. Over the years there has been technical, financial, organisational and political learning within the Council, Utilicom and indeed the wider base of customers and end users of the scheme. And this has been facilitated by the second principle – that of collaboration. A mutually, collaborative approach has been consistently adopted to learning with and from others. Whilst on the one hand you need a champion, Bill commented, you also need to recognise that: *“you can't do it alone, you need a strong partnership”* and this view is reflected not only with the Utilicom partnership, but also in the way the team have worked with customers and built links with European networks, the local University and other Local Authorities. From this has resulted an overall theme of shared ownership that has ensured continuity and a lack of dependency on one person.

So it's not a big ego project? (R)

RR

This links strongly to theories of 'post-heroic' leadership and

No its not and that's one of the things I would say. It has been developed by a number of people who have been in the scheme, left it, other people have come in and taken over and the knowledge transfer has been quite gradual. (BC)

Theme: Collaborative, open working.

The relationship between Utilicom and the council the relationship has a symbiotic quality: Mike moved across to work in Utilicom in 2006. In interview he confessed that his use of the term “we” varied still. Charles Maillard on the other hand has retired from the board of Utilicom and now does some work advising the council.

The collaborative learning is closely connected then to a principle of sharing ownership and success: politicians have been credited for the support; customers who connect to the scheme are awarded plaques and invited to celebrations; renewable energy experts from the local University run joint projects with the council. There is overall a pragmatic tolerance of multiple agendas exemplified in recent collaboration with Greenpeace on decentralised energy.

With partnership and collaborative working in this way, how then is success felt? And how is recognition sought and gained when there are no ‘heroes’?

Reward & Recognition: Influence

What seems to bind this multi-partner work is a shared sense of purpose that is embodied in the concrete fact of the scheme.

Its success is after all easy to grasp – if it is growing and has customers then it is successful and everyone can share in that.

That's still the case now. I get a real buzz when we've got new [connections] (MS)

A second source of reward comes however with the growing influence of the scheme.

Southampton has been invited to present to Government departments and they have also actively sought to influence government policy – providing input to the Energy White Paper, the Local government act among others.

Theme: Local – Central government relationship – mutually influencing.

At sub-regional level, Southampton City Council also have increased influence as they bring their experience in sustainable energy to a recently formed coalition of some 11 local authorities that have come together in a partnership to address climate change²⁶. This brings an interesting mix of agendas to the collaborative process. It is a new way of working and an opportunity to bring the experiences learnt at Southampton to a new setting

And in Europe too their profile is increasing. Their links there have always been strong and they work to market the scheme and make it known there. As much as they visited (and continue to visit) sites in Europe, people from the UK and abroad now come to visit them. Whereas they participated in the European networks –

I say....oh that's a good system ...how big is it...they say "we've got 100K of pipe" and I think "we've only got 11!" And I said what's the power output? They say 42MW. And I think "gosh – ours is less than 10!" I thought this is going on in Europe, big new technology that is going on there and it's partly drawn from our experience here in the UK

Energie Cities and Eurocities - originally to learn, now they are invited to seminars to present their scheme as an example of best practice. The relationship with Europe is at once inspiring and gratifying as illustrated by Bill's description of a recent visit he paid to a huge CHP-Geothermal project near Zakopane in Poland.

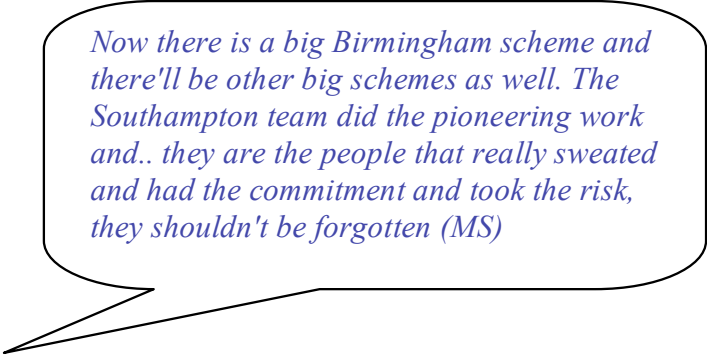
Theme: A strong outward focus balancing well with a local focus.

²⁶ This is known as PUSH – Partnership for Urban South Hampshire

Kudos through Replication

All this influence is a source of kudos for the scheme but this appears to be enjoyed when it happens rather than actively sought. I had a sense that the reward that is most actively sought relates to a wider purpose of tackling climate change, what they now call '*the change agenda*' (BC). Framed this way, recognition for the scheme comes from its extension and proliferation. Marketing is done with this in mind. This may explain why at a national level, the scheme is less well known, whilst at the same time it's ideas are spreading.

In the UK, via Utilicom, what has been pioneered in Southampton is being directly replicated with proposed schemes in Birmingham, Eastleigh and elsewhere. It is not just the pipes that are being replicated but also the whole way of working – from the joint co-operation group to the financial models.



Now there is a big Birmingham scheme and there'll be other big schemes as well. The Southampton team did the pioneering work and.. they are the people that really sweated and had the commitment and took the risk, they shouldn't be forgotten (MS)

Characteristically Mike is ever mindful that the original innovators enjoy a share in these new successes. Replication is, in its own way, a testimony to the fact that the capacity developed here over many years is ready to flourish into capability elsewhere.

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. These are not presented in any particular order.

Theme	Description
Themes arising directly from this Learning History	
Recognition & Reward - shared success	Comes from the ‘health’ and success of the scheme – its growth (e.g. connections), expansion and increasing influence. Awards not as actively sought (Ashden, Beacons) Less well known nationally as a result? Reward and kudos for those involved. With money, drives how time is spent e.g. LAA stretch targets rather than Beacon.
Champions With political capital Personal values Tenacious Collective	Well placed champions – members and officers Acting from personal conviction Qualities of tenacity (Mike and Bill) Non ego based, a collective of champions
Cross-party Support	A key enabler for the scheme. Links to themes of ‘sharing successes and virtuous cycles of trust.
Capacity- building Long-term Multiple agendas	Capacity was built over a long time (as with other Histories) and on the back of shifting agendas over time
Shifting agendas Changing Convergent	The backdrop and motivations changed over time. E.g. Drilling the well (fuel-crisis), LA21 (sustainability), Small scheme (geothermal heat), Big scheme (decentralised energy & climate change). Greenways & LA21 agenda converging with the energy agenda – links to Barnsley & Kirklees LH.
Luck	There was some larger luck and serendipity in this project (the well being dug in the first place, well placed and skilled champions) though not many lucky moments (one e.g., was the coffee leading to getting EU funding) and these linked with tenacity. Finding Utilicom with the experience to develop a Geothermal Scheme
Risk Subjective Of being a pioneer	Themes of subjective risk – different when viewed through lens of an accountant accustomed to big budgets and skilled in ‘placing’ and ‘managing’ risk.

<p>Lack of technical skills Lack of business models Financial Risk Reputational risk Placing Risk Risk of being different</p>	<p>Risk due to lack of knowledge was transferred to partners or sectors with that knowledge (Utilicom, Oil driller etc). Financial risk was shared (DoE, Utilicom, Customers) Reputational risk associated with doing something new (Council, Customers). Customer's perceived risk in connecting was sometimes higher than warranted – links to professionalism.</p>
<p>Catalyst as a kick-start Technical catalyst Financial catalyst</p> <p>Catalyst for 'the change agenda'</p>	<p>Notion of a catalyst a recurrent theme</p> <ul style="list-style-type: none"> - The Geothermal - The well being dug and requiring no return (literally a sunk cost) – similar to high capital costs being met by grants in Kirklees and Barnsley. - The scheme itself as a catalyst for reducing carbon in other schemes.
<p>Professional practices and Organisational Routines – barrier Risk of being different Jobsworth Whole-life costings Shifting mental maps</p>	<p>Recurring theme of 'how things are done' blocking progress. Std practices of for example procurement, architecture, planning etc. proved barriers at times to bringing about change. Resistance to whole life costings too, Different agendas can also block 'it's my job'. Scheme described as a challenge to the 'predict and provide' mentality of energy supply</p>
<p>Working outside professional boundaries – enabler Beyond stereotypes New ways of working</p>	<p>Several examples of people working outside their 'professional' boundaries/stereotypes of for example Lawyers, Accountants. Also the way the council team is interdisciplinary, how coalitions have been formed, exciting meetings across organisations at sub-regional level. Overall a theme themes of new work practices and skills being necessary to address climate</p>
<p>Socio-technical shift - New ways of doing 'heating' and 'cooling'</p>	<p>New ways of doing 'heating' have emerged. Scheme necessitates new user practices (no boilers), skills (responsibilities (don't dig up pipes), financial models (longer contracts) etc etc.</p>
<p>Legislative context Barriers and enablers Changing, confusing</p>	<ul style="list-style-type: none"> - Price of electricity back to the grid (barrier) - Merton Rule (enabler) - New planning powers (enabler) - Seeking endorsement for local energy schemes via energy white paper - Need for primary legislation - Legislative confusion

	<ul style="list-style-type: none"> - Code Sustainable homes - HECA act – revoked, Climate change Bill
Local-Central Gov	Framed as an influencing relationship Some frustration with lack of primary legislation
Trust Intention of trust Growing trust	Long-term partnership with Utilicom founded on trust. Building trust and relationship with customers. Growing trust as the scheme grew.
Learning Users learning Mutual with others Collaborating Actively seeking to replicate	Learning highly valued as a team as well as with partners and customers. Willingness to learn from other places. Committed to spreading learning – sees it as part of the overall agenda
No turning back moments <ul style="list-style-type: none"> - via agreements - infrastructure 	Echoing a theme in Kirklees there are several ‘no turning back’ moments when support is solidified into real action such as a dug well, a joint co-operation agreement or laid mains pipes.
Strong outward Focus Learning Influencing Robust local base	Not insular – very outward facing – to government and European networks as well as locally. Sees value in influencing – links it to success and learning. Value too in being influenced. This however built on a strong local base built up over years.
Knowledge Buying it in Placement of Configuring Translating Hard & Soft skills	A vast amount of new knowledge was required (technical, financial...). Key was not so much having all that knowledge but knowing how to bring it together: straddling organisations in order to configure and leverage it. Obvious when they knew. Some knowledge in key champions was crucial particularly when combined with ‘softer’ skills
Post Heroic Leadership Partnership Working Sharing ownership Coalition working Openness to other agendas Pragmatism	Strong themes of partnership working, sharing success, coalition working throughout the learning history. Knowledge in team not vested in one person. No resistance to others being involved. Transparency (e.g. open book accounting). Pragmatic tolerance of multiple agendas (e.g. Greenpeace)
Power of a symbol Marketing	Geothermal a powerful element of the scheme for its marketing
Technology vs. Infrastructure	Relating to previous pt, CHP and the network hard for some people to link. CHP is a big engine;

	network is infrastructure. Not like a wind turbine. People link more to a technology.
Financial Innovation Knowledge Robust Business Case New finance models Whole life cycle analysis	Having someone on board who understood the finances and who could get the business case to stack up was crucial (Links to Barnsley). There is continued financial innovation – c.f. the recently ‘invest-to-save’ program. Able to do whole life cycle costings (Barnsley, Kirklees)
Legal Innovation	The legal agreement was innovative.
Vision with Pragmatism Timing – near & far view	Theme of working with an evolving vision. Small steps taken against a long-term view (25 year contracts, scaling up the scheme)
Scale	The sheer scale of the scheme is a theme. Costs reflect that Scale of breakdown is greater Scale of Desire to scale up and increase scale
Quiet Passion Steady ambition & Tenacity Anger	Non-heroic narrative Deeply felt commitment to tackling climate change. Some quiet desperation expressed: with lack of supportive legislation, and those not willing to address climate change
Stepwise approach	Short loops of demonstration and validity. Virtuous cycles gaining trust and competence (e.g. Greenways won recognition, first heating connection showed the system could work etc).
Creation of reputation and story	Reputations boosted by involvement with the scheme. Story itself not actively marketed – built more on reputation, Utilicom’s work and involvement in networks. Approaches can result more as happenstance (e.g. Mayor’s visit)
Themes from other Learning Histories – Less Strong Here	
Power	Not a strong theme beyond the use of positional power to push through change.
Institutional Forces – Copying, mimicking and competing with other local authorities/projects.	Institutional forces appeared strong here but more complex than predicted by institutional theory as boundaries became less accentuated and coalition and partnerships that straddle organisational boundaries become important. Only friendly competition with Woking – general admiration for that project and achievements there.

Table 1 List of themes.

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