Understanding Consumer Attitudes to "Sustainable Community Infrastructure"

Research for the UK Green Building Council & the Zero Carbon Hub, November 2009

NHBC Foundation

Housing research in partnership with BRE Trust

UK GREEN BUILDING COUNCIL

ZERO CARBON HUB

ícaro consulting

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Executive Summary

Introduction

This summary presents key findings from research undertaken by Icaro Consulting - on behalf of the UK Green Building Council and the Zero Carbon Hub, and funded by the NHBC Foundation – to explore consumer reactions to the constituent elements of 'sustainable community infrastructure', i.e. community heat, water, waste and ICT. Building on the work of DECC's *Big Energy Shift,* the research also explored the integrated community proposition as a whole and – fundamentally - whether or not these are areas that the public want to live.

Methodology

The research process involved two main phases of work with consumers:

- A national survey, designed by Icaro Consulting and undertaken online by Ipsos MORI with a representative sample of 1,074 adults aged 18+ in Great Britain, in October 2009. The questionnaire, using explanatory text and graphical representations about sustainable community infrastructure, was designed to capture both consumers' *spontaneous reactions* as well as their responses to *detailed information* on each of the various constituent elements.
- Two focus groups, conducted in Reading, with both *future home buyers* aged 25-40, and *existing home owners* aged 25-65. The discussions involved both spontaneous, top of mind reactions (indicative of how people might react on hearing about the idea for the first time) as well as more reflective and deliberative debate (indicative of how they might respond as more information becomes available on what it would mean for them as homeowners).

Key Findings

I. Spontaneous responses

Consumers spontaneously identify a wide range of positive aspects. The water elements (particularly rainwater harvesting) stand out, accounting for just over a third of the initial positive reactions, followed by aspects of the energy/heating system (e.g. smart metering, low carbon homes), and aspects of the waste system (e.g. community recycling, underground disposal). Environmental benefits are identified by just over one in ten (13%), while a similar proportion flag housing (10%) and community-related benefits (8%).

Turning to spontaneous dislikes, both the survey and focus groups confirm that consumers have very few negative reactions to the proposition outright, but rather they do have a host of questions, caveats and 'conditions attached'. These range from questions about very practical aspects (e.g. how much disruption? What happens if the system breaks down? How does the billing work?), through to demands for safeguards against 'free-riders' in the community taking unfair advantage, as well as questions about the upfront costs.

II. Element-specific responses

Certain aspects of **community heating networks** are rated very positively – most notably security of supply (79% consider this positive), enabling individuals to live a 'greener' lifestyle (79%) and taking the responsibility for purchasing and maintaining equipment away from individual householders (74%). However, other implications elicit some negative responses, most notably in terms of households having to have an electric, rather than gas, cooker (42% consider this to be negative). Disruption (to both the home and community) is also a divisive issue, with around one in three negative but a similar proportion relatively ambivalent.

Turning to the energy source for the local energy centre, *all* of the options presented are considered acceptable by a majority. Nonetheless, a hierarchy of preference is evident - led by solar panels, Energy from Waste (via Anaerobic Digestion) and ground-source heat pumps (all considered acceptable by over 75%). Energy from waste (via incineration) is, perhaps surprisingly, also considered an acceptable fuel source by many (71%). In fact, the highest levels of unacceptability are seen for a series of wind turbines (21%) and biomass boilers (16%) – even though the balance of opinion remains in favour. The focus groups do suggest, however, that the exact location of the local energy centre, its size and its proximity to residential housing, are potential issues of concern.

Reactions to the **water system** are very positive, almost across the board. This is particularly true of using rainwater harvesting for flushing toilets/watering gardens (89% think this is positive), as well as having more green spaces to – among other things - absorb water (89%), not wasting water (87%), and using 'greywater' for flushing toilets/watering gardens (84%). The one potential exception is the use of greywater to supply things like washing machines. While the majority remain positive (65%), a significant minority of around one in five are negative (19%). Indeed, the focus groups confirm that while some are unfazed by the prospect of greywater recycling across a range of in-home uses, a significant proportion – particularly younger respondents - harbour significant concerns.

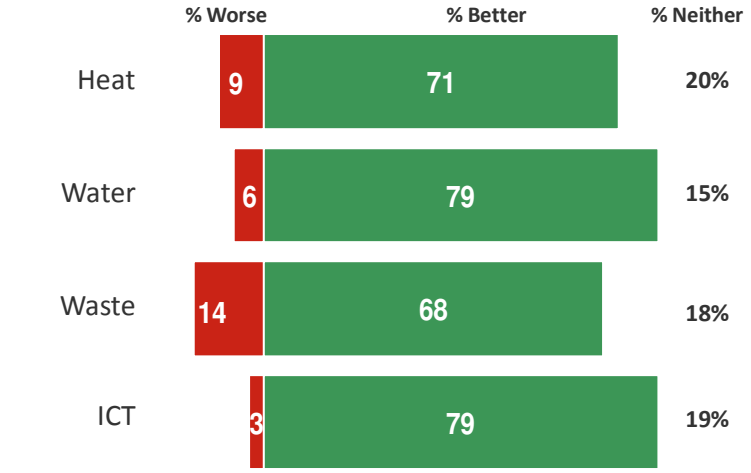
The same pattern is true of the elements that might make up a community **waste & recycling network**, with many facets considered very positively (e.g. using local waste as a source of energy (87%), the idea of an underground waste system (75%)), but with an exception. Indeed, the one feature that elicits a high proportion of negative views – among close to one in three (32%) - is the fact that residents would need to take waste and recycling to local street collection points if an underground system was implemented. Indeed, the focus groups find that the actual distance to the local collection points is a key determinant of public attitudes, so much so that it can shift negative views to positive, and vice versa. The focus groups also revealed some concerns, given the novelty of the underground technology, about the reliability of the system and what happens when it breaks down.

Turning to **ICT**, the potential for faster broadband proves, unsurprisingly, to be a 'no brainer' (86% consider this positive), as does 'smart' metering (83%) and an in-home 'hub' to control appliances (81%). There is slightly more ambivalence towards the idea of a community intranet, which the focus groups suggest is because of a demand for more face to face, rather than online, interaction. Finally, while the quantitative survey suggests the balance of opinion is positive towards the community system balancing out demand and supply (including the option for the system to switch off appliances in the home), further exploration in the focus groups suggests that external control of individuals' homes – even at a relatively minor level or for short periods of time – is controversial and potentially seen by many as an invasion of privacy.

Looking across the four services as a whole, the survey demonstrates that a majority consider them all to be 'better' than the equivalent services that they current receive (Figure S1).

Figure S1. Rating the services relative to current supply

Q. Based on the above information, and compared to the way in which heat/water/ICT/waste collection is currently supplied in your property, do you think this proposition is better, worse or neither better nor worse?



Base: 1,074 GB adults aged 18-64, interviewed online, Ipsos MORI, October 2009

III. Management

The research reveals a somewhat mixed picture to management options with no clear outcome, and one where the issue of trust appears to weigh heavily on the responses.

Taking the question of leadership first, while no one organisation dominates it is evidently the various tiers of Government to which consumers turn, i.e. local authorities (24%), national government (20%) and, to a lesser extent, regional government (10% - with the exception of respondents in London where regional government is perceived to have a more prominent role). The local community (14%) also feature relatively high up the list as important stakeholders.

Turning to the subsequent day-to-day management of community services, local authorities are identified most frequently as most trusted, albeit by less than one in four (23%). Also popular are a local community group coming together and establishing a co-operative business model (19%), and a newly set up local utility, working in partnership with one of the main gas and water utilities (15%). Only 8% identify national government as the organisation they trust most to run sustainable community infrastructure, compared to 36% who trust them the least. The same is true of the major utilities – most trusted by 7%, but least trusted by 37%.

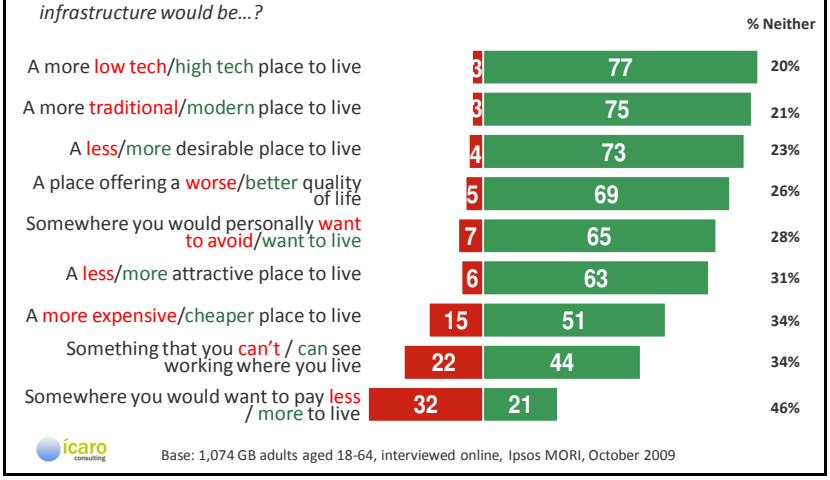
But the conundrum for the proposition is that, even for those groups identified as the most trusted to run the scheme, there are an equivalent proportion of consumers who disagree. For example, while 23% trust local authorities the most, 26% trust them the least. Likewise, 19% trust local community co-operatives most, compared to 17% who trust them the least.

IV. Overall Perceptions

The survey demonstrates that consumers' default perception is that a neighbourhood with sustainable community infrastructure is high tech, modern, attractive and desirable, offers a better quality of life, and would be somewhere that they would personally want to live (Figure S2). The survey does though suggest two key perceptual barriers: scepticism about the alleged cost savings, and being able to see the proposition "working in their area".

Figure S2: What kind of place would it be to live in?

Q. In summary, do you think a neighbourhood with these kinds of sustainable community infrastructure would be…?

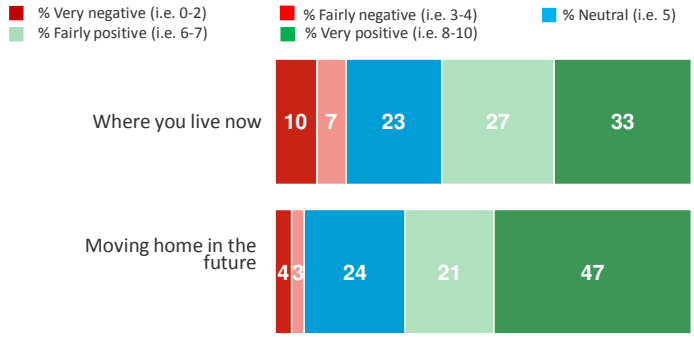


Base: 1,074 GB adults aged 18-64, interviewed online, Ipsos MORI, October 2009

On the basis of all that they had seen, consumers were asked how positive, negative or neutral they are to living in a neighbourhood with sustainable community infrastructure, both in terms of where they live now as well as moving home in the future. In **both instances** the balance of opinion is positive – 60% say they would be positive about the area they live in being re-designed to have sustainable community infrastructure, compared to 68% who would be positive about moving to an area with the infrastructure already installed (Figure S3). In contrast, 17% and 7%, respectively, respond negatively, whereas close to one in four in both instances are neutral.

Figure S3. Overall Reactions – Existing and Future Homes

Q. In terms of where you live now, on a scale of 1-10 how positive, negative or neutral would you be if the area was re-designed and re-developed to have sustainable community infrastructure?
Q. And, thinking about moving home in the future, how positive, negative or neutral would you be about living in an area with sustainable community infrastructure already installed?



Base: 1,074 GB adults aged 18+, interviewed online, Ipsos MORI, October 2009

Although default perceptions may be positive and negative aspects relatively few in number, the focus groups suggest that these headline responses are *conditional*, with most questions and concerns focused on *practicality* and the *devil in the detail*. Five key and cross cutting issues stood out from the group discussions:

Cost savings - participants were strongly motivated by cost savings, and the discussions revealed two key themes. First, in order for participants to feel comfortable about the notion of 'sharing resources' with others, they needed to feel that processes around billing and maintenance charges would be 'fair'. Second, the power of the cost saving argument was muted for some by the length of time it might take to realise savings, and also by scepticism that any savings would in fact not be passed on in lower bills and/or council tax reductions.

Threat of technology failure – participants were keen to understand more about contingency measures in the event of system failures (whether pipe blockages in the underground waste system or boiler failure). The default perception is that repairs would take weeks rather than hours or days, causing significant local disruption.

Individual control and personal choice – the issue appeared in several contexts, but most specifically in relation to contract length with the supplier, and there was a sense of unease at being perceived to be 'locked in'.

Case studies & normalisation – participants lacked any kind of real reference point for sustainable community infrastructure, and so they had difficulty imagining how this could work in their area. On learning of working systems elsewhere in the UK, many participants had questions about 'how it works there'.

Disruption – some assumed that retrofitting the infrastructure would involve massive upheaval within their home and in the local neighbourhood, which would act as a major barrier to their desire to be part of such a system. However, moderate levels of disruption involving days rather than weeks (or even months, as several participants assumed) were considered more tolerable. Indeed, some participants were actually relatively ambivalent, noting that disruption in terms of e.g. road works, had become a normalised part of 'daily life':

V. Segmentation & Targeting

In order to explore how the findings vary across different groups in the population, Factor and Cluster statistical analysis was undertaken on the findings. The result is a consumer segmentation model relating specifically to sustainable community infrastructure, identifying **eight distinct segments** within the population.

The analysis supports the findings, noted above, about conditional support for the proposition. Indeed, many of the segments are based around the notion of 'contingent acceptability', i.e. many of the clusters are positive but this is contingent upon dealing with a specific issue around one or more features of the overall proposition (which vary from cluster to cluster). The possible exceptions to this are Cluster 6 (who are more positive than average across the board and – in being so – represent the 'Early Adopter' community) and, by contrast, Cluster 7 (who are more negative than average across several aspects). Table S1 provides a summary of the clusters, outlining the socio-demographic and attitudinal characteristics of each group.

Factors, Clusters, and Segment Profiles

	Cluster	Factor Profile	Socio-demographic Profile	Attitudinal Profile
Cluster1	**"Contingent Adopters: Heating Doubters" - 9% of population**	Low heat system benefits. Low tolerance of inconvenience. Highest ICT benefits.	Higher 45-54, lower 35-44. Lower active work status. Lower in South East/Anglia, higher London.	Most trusting of local authority. Most influenced by waste collection features.
Cluster2	**"ICT Technophobes" - 8% of population**	Lower than average ICT benefits. Highest water benefits.	Higher ownership outright. Lower 25-34 ages. Higher North England and South East & Anglia, Lower Scotland. Higher retired	Less favourable to retrofit of home. Lower than average desirability. Less likely to think community is 'close knit'.
Cluster3	**"Contingent Adopters: Attached to Gas" - 16% of population**	High attachment to gas. Above average Heat system benefits.	Higher than average outright ownership. Less likely than average to move again. Higher than average 55+. Higher than average social class.	Above average desirability. Most conscious of risks. Influenced by local approach/energy security
Cluster4	**"Contingent Adopters: Disruption-focused" - 14% of population**	Lower than average attachment to gas. Lower tolerance of inconvenience.	Higher than average private renting. More likely to move within 5 years. Highest 25-34 and 35-44 age groups. Higher than average women.	Above average desirability. Most likely to be influenced by a scheme that is beneficial to the environment.
Cluster5	**"Contingent Adopters: Waste Doubters" - 15% of population**	Lower waste and recycling benefits. Above average ICT & water benefits.	Higher ownership on a mortgage. Lower 18-24. Higher active work status. Higher London. Lower social class DE.	Most influenced by benefits to community. Most in favour of scheme led by regional government.
Cluster6	**"Early Adopters" - 17% of population**	Higher acceptability of alternative energy sources. Higher tolerance of inconvenience.	Higher outright ownership. Most likely to move in next 2 years. Low 18-24, High 55+. Lower social class B, higher C. Higher than average men.	Highest general desirability. Highest env-friendliness.
Cluster7	**"Serious Doubters" - 15% of population**	Lower water benefits. Lower tolerance of inconvenience.	Higher than average social renting. Least likely to move in next 2 years. High younger age groups. Highest Midlands, lowest South East/Anglia.	Less favourable to new build with proposed infrastructure. Lowest general desirability. Lowest env- friendliness.
Cluster8	**"Contingent Adopters: Energy Source Concerned" - 6% of population**	Lower acceptability of alternative energy sources. Higher waste/ recycling and water benefits.	High outright ownership. Most likely to move in 2-5 years. High 35-44, low 55+. Lower than average social class AB.	Above average desirability. Most concerned about the upfront costs. Most influenced by saving on bills.

VI. Conclusions & Implications

The research has demonstrated several clear and important insights about consumer attitudes to sustainable district infrastructure:

First, the default position for many consumers tends towards the positive, and there is no discernable evidence of any widespread or inherent dislike of the proposition (nor stigmatisation of community heat networks as 'poor mans' heat').

Second, rainwater harvesting stands out as a key positive driver and a potential gateway issue that attracts support for the broader proposition. Broader environmental and community benefits appeal strongly to a minority but – for the majority – are only strong enough to act as a secondary benefit. For these consumers it is the associations with 'improved efficiency' and 'reduced waste' that come to the fore, and with these cost savings.

In the focus groups participants were able to grasp the concept easily and quickly engaged with it. Indeed, rather than having immediate negative reactions, they instead raised a number of concerns and questions about the 'devil in the detail'. Some of the most important questions that need to be addressed are *cross cutting*, for example:

- How long it will take for consumers to benefit from cost savings?
- What contingency measures are in place in the event of system failures?
- What measures are in place to guard against 'free riders' in the community?
- How long will disruption last (since there is a world of difference between hours and days on the one hand, and weeks on the other)?

In contrast, other questions relate to *specific elements*. For example:

- Many of the water elements have the power to act as important 'hooks' that reflect positively on the proposition as a whole, with the exception of *greywater recycling* which stands out as the most problematic element.
- Likewise, many aspects of community heat are well received, with the exception of concerns over disruption, the fairness of billing and – for some - having to have electric cooking.

All of these positives, negatives and 'conditional positives' feed into a consumer segmentation model which demonstrates three key groups – *'Early Adopters'* (accounting for a substantial 17% of the public), *'Serious Doubters'* (15%), and a third, majority group of *'Contingent Adopters'* (which can itself be broken down into different types of contingent adopter). In terms of next steps, one job of work might include matching different propositions to different types of community, to enable different 'packages' to be built (and communicated).

Moreover, and as a final reflection, this research reinforces the findings from the *Big Energy Shift*. Consumers would undoubtedly benefit from more real examples in the UK to give them a 'reference point' that could address the questions they have about how it works. These examples will need to operate on different *spatial scales* and across different *neighbourhood types* in order to people to make sense of what it could mean for their neighbourhood, and whether or not it is for people 'like them' who they can identify with.

Introduction

Background & Objectives

This research, undertaken by Icaro Consulting on behalf of the UK Green Building Council and the Zero Carbon Hub, and funded by the NHBC Foundation, explored consumer reactions to the constituent elements of 'sustainable community infrastructure', i.e. community heat, water, waste and ICT.

This is a subject that, to date, has rarely been explored in terms of the potential benefits that integrated design and delivery could bring. The idea of low carbon homes in and of themselves has begun to be explored in various pieces of research[1], while the concept of community delivery was an element of the recent *Big Energy Shift* public dialogue, commissioned by the Department of Energy and Climate Change (DECC)[2].

The objective for this research was to build on the work of the *Big Energy Shift* and explore the idea of community infrastructure in much more detail, involving both the constituent elements of sustainable community infrastructure and also the integrated proposition overall.

Methodology

The research process involved two main phases of work with consumers, detailed below.

1. Quantitative Research

A quantitative survey was designed by Icaro Consulting and undertaken online by Ipsos MORI with a nationally representative sample of 1,074 adults aged 18+ in Great Britain, in October 2009. Data have been weighted to the known profile of the population in Great Britain.

The questionnaire was 20 minutes in length and designed to capture both consumers' *spontaneous reactions* as well as their responses to *detailed information* on each of the constituent elements of sustainable community infrastructure, i.e. heating, water, waste & recycling and ICT.

For example, the proposition of sustainable community infrastructure was introduced with some explanatory text and a graphical representation (Box 1 & Figure 1) to make it as 'real' as possible, rather than completely abstract. Participants were asked first for their spontaneous and unprompted views on what they had read and seen, outlining what they 'liked most' about the proposition and what they 'liked least'. They were then asked about specific aspects, rating each as positive, neutral or negative. A final summary section then captured their overall views on the proposition as a whole. The questionnaire and topline findings are outlined in Appendix 1.

[1] *Zero Carbon: what does it mean to home owners and house builders?* NHBC Foundation April (2008)

[2] www.bigenergyshift.org.uk

Box 1 / Figure 1 – Introductory Text & Diagram

We would like to ask you some questions about a way of delivering services to your home - like heating, water and waste collection – on a community scale. There are a lot of similarities to the way that these services are delivered currently, as well as some important differences. Therefore, to give you a better sense of what the scheme involves, there's a bit of reading, a diagram and then the questions.

The systems are sometimes called different things, and here we will refer to them as "sustainable community infrastructure". They vary depending on local circumstances. Sometimes it is just a single utility – like heat - being supplied across the community; at other times it is other utilities as well like water, waste collection and Information and Communications Technology (ICT). The systems can be easily designed into new communities, and they can also sometimes be 'retrofitted' into existing communities.

There are already some examples in the UK (e.g. in Woking, Surrey and as part of a new development in Kings Cross, London) but they remain much more common in other parts of Europe (for example, they supply 60% of heat demand in Denmark compared to just 2% in the UK).

The objective of sustainable community infrastructure is to be more efficient in the use of resources, which would offer several benefits to the community, e.g.:

- Significant carbon reductions and environmental benefits;
- Saving money; and
- Local independence for the community, as well as ensuring that the country as a whole has greater security of supply in terms of resources like energy and water.

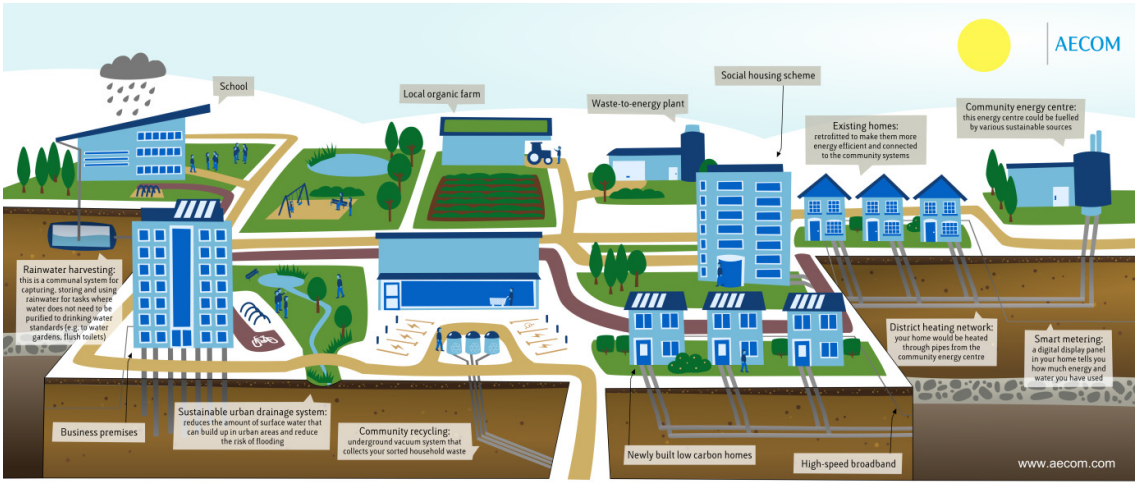
Potential challenges include:

- In existing communities, installation of the infrastructure would cause some disruption to roads and homes
- New management systems may be needed to set up and maintain the services; and
- The costs of installing the infrastructure could mean that households might not necessarily see an immediate reduction in their bills. Instead, savings would be seen over time.

Sustainable community infrastructure will not be appropriate for every area, or everyone, and there is no single "package" - sometimes they would involve heating only, and at other times including water, waste and ICT.

Therefore, we would like to describe the system and then ask you questions to see which aspects you consider to be strengths, which aspects you consider to be weaknesses, and whether – overall – you can see this "working for you".

First of all, the following diagram sets out how an idealised system would work, based around a local community energy centre that supplies individual homes. Click here to continue



2. Qualitative Research

The qualitative strand of the research involved two focus groups, each with 8 consumers (16 in total). Both groups were conducted in Reading on 29 October 2009. Qualitative research is particularly well suited to dig beneath the quantitative headlines and unpick some of the underlying (and occasionally subconscious) influences that underpin consumers' perceptions. These two groups, while by no means representing an extensive or systematic qualitative exercise, nonetheless add an important dimension to the overall findings.

Recruitment was undertaken face-to-face and in-street by Criteria Ltd, according to a questionnaire to ensure representation from two main groups: *future home buyers* (currently renting privately) aged 25-40, and *existing home owners* aged 25-65. The groups each lasted 2 hours and were structured according to a discussion guide.

The same stimulus material that was used in the quantitative survey was deployed here, with an A3 mock up of Figure 1 used to begin the discussion, and the same additional material was progressively given to participants in order to build up the picture around the constituent elements of heating, water, waste and ICT.

This provided a balance between spontaneous, top of mind reactions (indicative of how people might react on hearing about the idea for the first time) as well as more reflective and deliberative debate (indicative of how they might respond as more information becomes available on what it would mean for them as homeowners).

A series of quotes from participants are included in this report, and these views are those of individuals, not the UK Green Building Council, the Zero Carbon Hub or Icaro Consulting. Participants were paid £50 for their time.

Structure of the report

This report is divided into four main sections, as follows:

1. Headline results from the quantitative survey
2. Identifying groups among consumers - statistical Factor and Cluster Analysis
3. Headline findings from the focus groups
4. Conclusions & implications

SECTION ONE.

Headline Survey Results

I. 'Top of mind' reactions

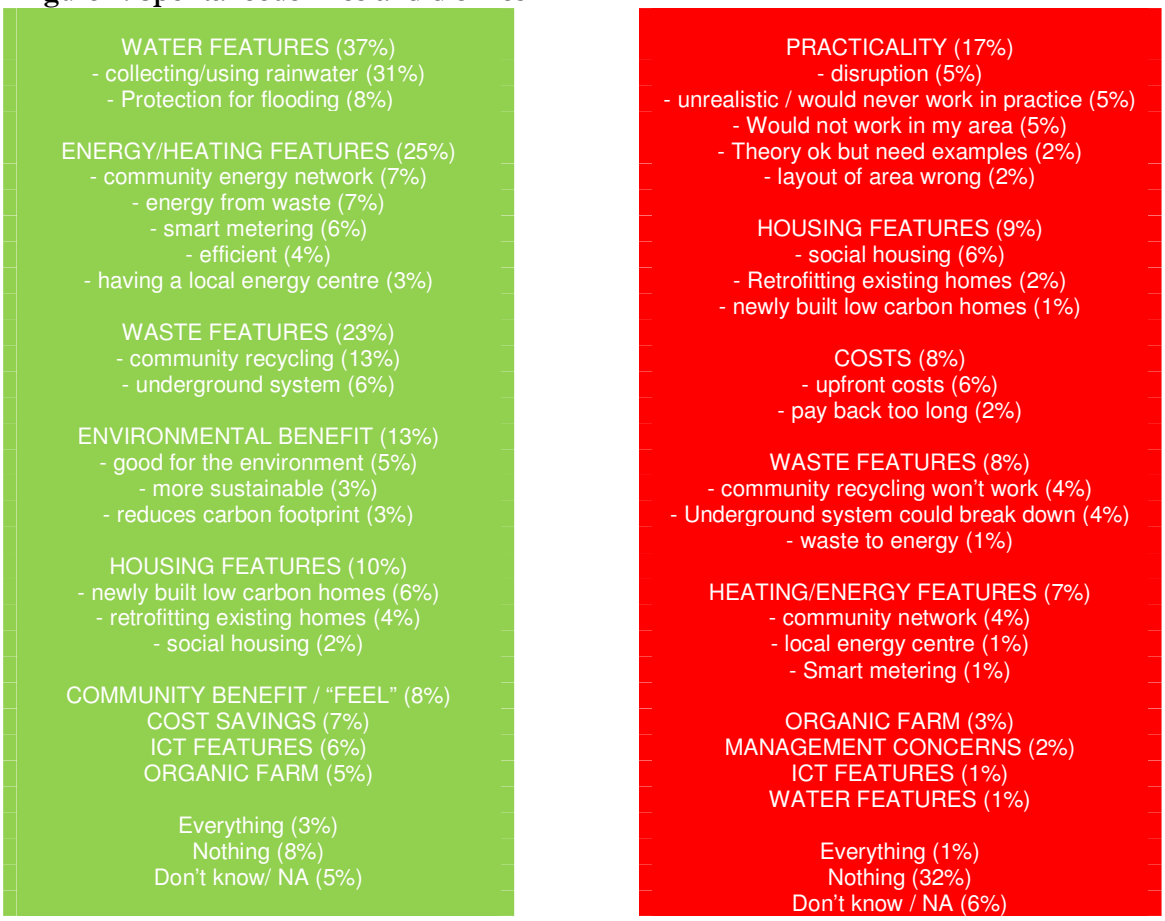
The first section of the survey dealt with respondents' spontaneous reactions to the introductory text and diagram that set out the basic premise of sustainable community infrastructure (see Box 1 & Figure 1 in 'Introduction'). This is important to understand consumers' 'gut reaction' to the proposition, as well as the specific elements that 'stand out' to them or not.

Figure 2 outlines key 'likes' and 'dislikes' about the proposition. On likes, two things are clear: First, consumers spontaneously identify a wide range of positive elements; second, it is the water elements (particularly rainwater harvesting) that attract the most immediate attention (accounting for just over a third of the initial positive reactions). Aspects of the energy/heating system (25%) and waste & recycling system (23%) also both feature prominently. Environmental benefits are identified by just over one in ten (13%), while a similar proportion flag housing (10%) and community-related benefits (8%).

Turning to dislikes, Figure 2 also shows a diverse range of perceived drawbacks. Issues around practicality feature most prominently in consumers' minds (17%), specifically in relation to disruption and whether it could work in practice/their own area. Housing-related features (9%) are also prominent (including negative attitudes towards social housing), as are concerns about cost (8%) and risks in the technology (particularly in relation to the underground waste system). However, it is worth noting that the most frequent response to the question "what do you not like" is 'nothing' - accounting for close to one in three responses (32%).

It is also noteworthy that several aspects of the proposition appear in both the 'liked' and 'disliked' columns. Even relatively specific aspects of the diagram are significant, with the idea of the local organic farm, for example, eliciting 5% of spontaneous positive comments as well as a not dissimilar proportion (3%) of negative reactions. Energy from waste is another issue to appear in both columns, although spontaneous positive comments (7%) outweigh the negative (1%). The same is true of low carbon housing, which 6% pick out positively compared to 1% who spontaneously consider this a negative aspect of the overall proposition.

Figure 2. Spontaneous likes and dislikes



II. Reactions to specific elements

The survey explored four key components of sustainable infrastructure: heat, water, waste, and ICT services. For each component a range of impacts were presented to respondents, and they rated these as either positive, negative or neutral (on a scale of 0-10 where 0-2 is taken to indicate 'very negative', 3-4 'fairly negative', 5 'neutral', 6-7 'fairly positive' and 8-10 'very positive').

Heating

Figure 3 outlines consumers' reactions to 12 implications of a community heat network. Certain aspects are received very positively, including security of supply (79% consider this positive), enabling individuals to live a 'greener' lifestyle (79%), making sure everyone else in the community is also being 'greener' (79%), as well as taking the responsibility for purchasing and maintaining equipment away from individual householders (74%). Only a small minority of less than one in ten consider each of these to be negative implications.

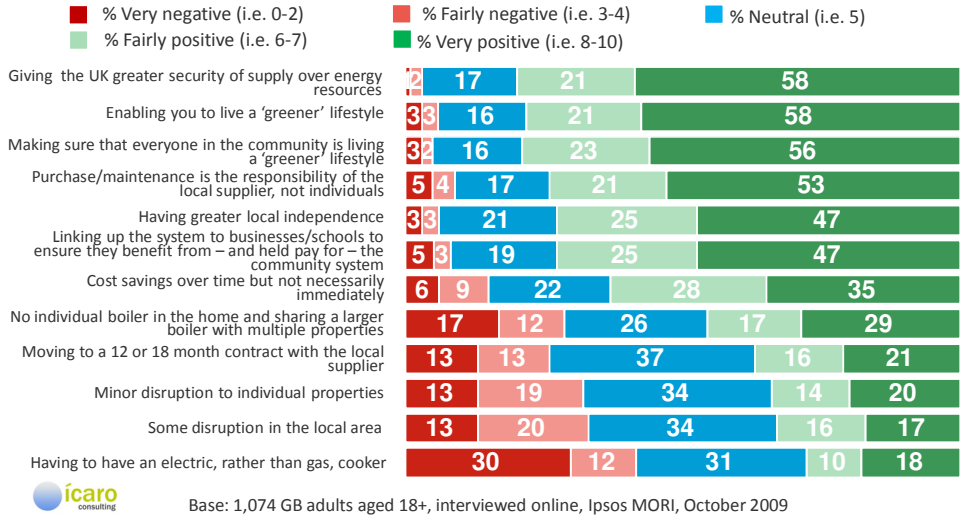
However, other implications are considered in a more negative light, most notably in terms of households having to have an electric, rather than gas, cooker (42% consider this to be negative compared to 28% who judge it to be a positive development). Disruption (to both the home and

community) is also a divisive issue, with around one in three considering this a negative feature of the proposition, whereas a similar proportion is ambivalent.

It is also noteworthy that the cost saving angle is not perceived as positively as might be expected. These savings, which accrue over time rather than immediately, are considered a positive aspect by 63%, although close to one in five (22%) are ambivalent and a substantial minority (15%) are negative.

Figure 3. Sustainable Community Heating: Reactions

Q. Picking up on some of the common features of a sustainable community heat system, to what extent do you personally consider each to be positive, negative or neutral?

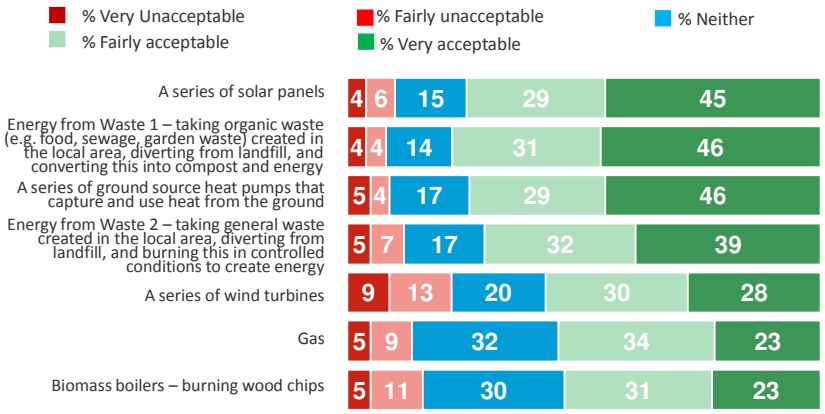


Base: 1,074 GB adults aged 18+, interviewed online, Ipsos MORI, October 2009

Turning to the energy source for the local energy centre, Figure 4 demonstrates that *all* of the options presented are considered acceptable by a majority of consumers. Nonetheless, a hierarchy of preference is evident - led by solar panels, energy from waste "1" (i.e. Anaerobic Digestion) and ground-source heat pumps. Energy from waste "2" (i.e. incineration of waste) is also considered an acceptable fuel source by many (71%), although the proportion considering this unacceptable rises to 12%. In fact, the highest levels of unacceptability are seen for a series of wind turbines (21%) and biomass boilers (16%) – even though the balance of opinion remains in favour (with 58% and 54%, respectively, considering them acceptable sources of energy).

Figure 4. Acceptability of different energy sources

Q. The local energy centre could be fuelled by various sources of energy, either one source or a combination. How acceptable or unacceptable do you think the following would be for your local area?



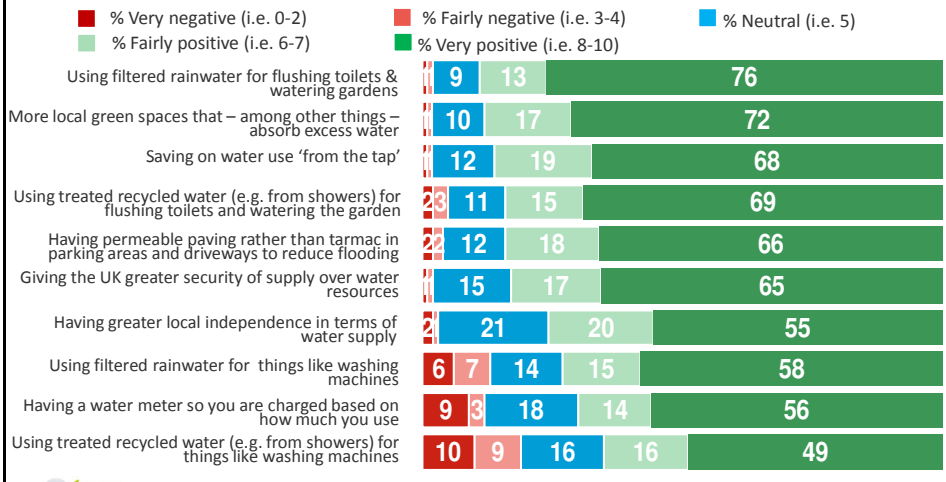
Base: 1,074 GB adults aged 18+, interviewed online, Ipsos MORI, October 2009

Water

Figure 5 outlines consumers' reactions to 10 implications of a community water system. These are almost considered positively across the board – most notably the idea of using filtered rainwater for things like flushing toilets and watering gardens (89% think this is positive), having more green spaces to – among other things – absorb water (89%), and using treated recycled water (e.g. from showers) for flushing toilets and watering gardens (84%). The one potential exception is the use of treated recycled water to supply water for washing machines. While the majority of consumers are positive (65%), this is a negative feature of the proposition for a significant minority of around one in five (19%).

Figure 5. Sustainable Community Water: Reactions

Q. Picking up on some of the common features of a sustainable community water system, to what extent do you personally consider each to be positive, negative or neutral?



Base: 1,074 GB adults aged 18+, interviewed online, Ipsos MORI, October 2009

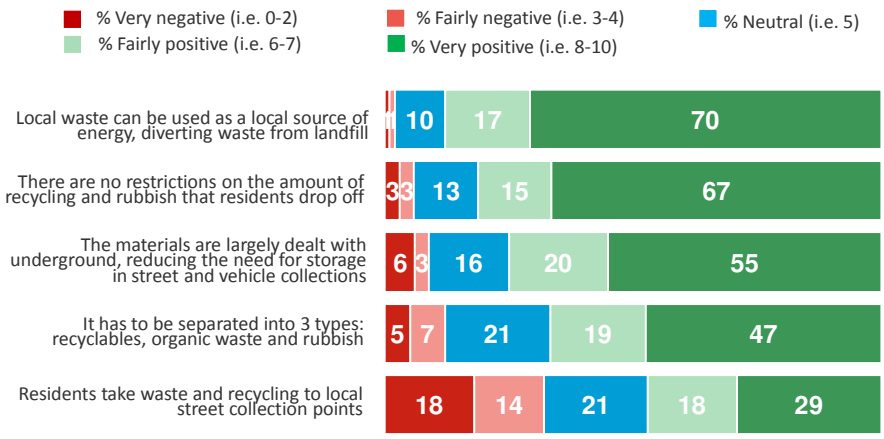
Waste

Figure 6 outlines consumers' reactions to five implications of a community waste & recycling network. Supporting the results from previous questions, the principle of using local waste as a source of energy is viewed positively by a strong majority (87%) of consumers. This is also true of the fact that residents potentially face no restrictions on the amount of recycling and residual waste that they drop off (82%), and the idea of an underground waste system (75%).

The one feature that elicits a high proportion of negative views – among close to one in three (32%) - is the fact that residents may need to take waste and recycling to local street collection points (distances were unspecified). In contrast, approaching half (47%) consider this as a positive development.

Figure 6. Sustainable Community Waste: Reactions

Q. Picking up on some of the common features of a sustainable community waste system, to what extent do you personally consider each to be positive, negative or neutral?



Base: 1,074 GB adults aged 18+, interviewed online, Ipsos MORI, October 2009

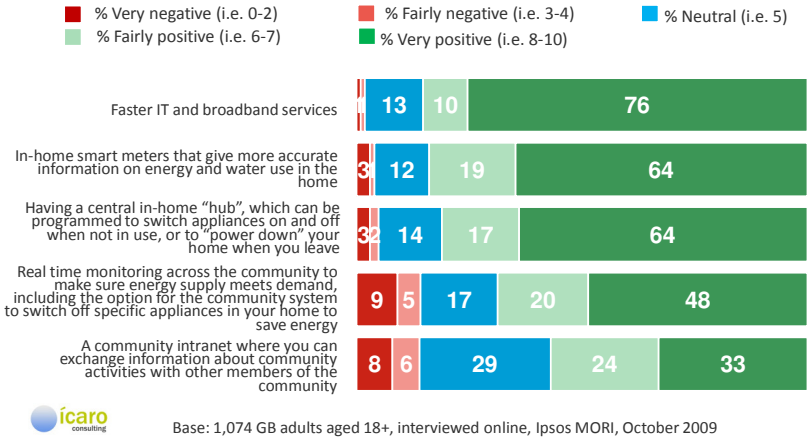
ICT

Figure 7 outlines consumers' reactions to five implications of community ICT infrastructure. The potential for faster broadband proves, unsurprisingly, to be a 'no brainer' with as many as 86% considering this a positive development. The same is true of smart metering and an in-home 'hub' to control and 'power down' appliances - both of which are viewed very positively by large majorities (by 83% and 81%, respectively).

There is more ambivalence towards the idea of a community intranet, with approaching one in three (29%) rating this as only a 'neutral' proposition. Over half (57%), though, see it in a positive light. In addition, the idea of the community system balancing out demand and supply - including the option for the system to switch off appliances in the home - is interesting. While the overall balance of opinion remains positive, negative responses begin to rise (to 14%) compared with the other ICT elements. The focus group discussions outlined in Section 3 also suggest that there is more to this issue than the headline survey finding would alone suggest.

Figure 7. Sustainable Community ICT: Reactions

Q. Picking up on some of the common features of a sustainable community ICT system, to what extent do you personally consider each to be positive, negative or neutral?



Base: 1,074 GB adults aged 18+, interviewed online, Ipsos MORI, October 2009

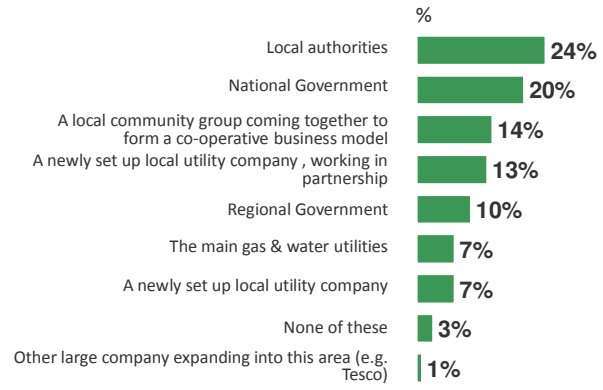
III. Management / Leadership

Turning to both the initial leadership on sustainable community infrastructure, as well as the subsequent day-to-day management, the survey reveals a somewhat mixed picture with no clear outcome and one where the issue of trust appears to weigh heavily on the responses.

Taking leadership first, Figure 8 demonstrates that – while no one organisation dominates – consumers tend to look to the various tiers of Government, i.e. local authorities, national government and, to a lesser extent, regional government (with the exception of respondents in London where regional government is perceived to have a more prominent leadership role). The local community also feature relatively high up the list as important stakeholders.

Figure 8. Leadership

Q. Which <u>one</u> of the following groups, if any, do you think should be responsible for leading on the idea of sustainable community infrastructure?

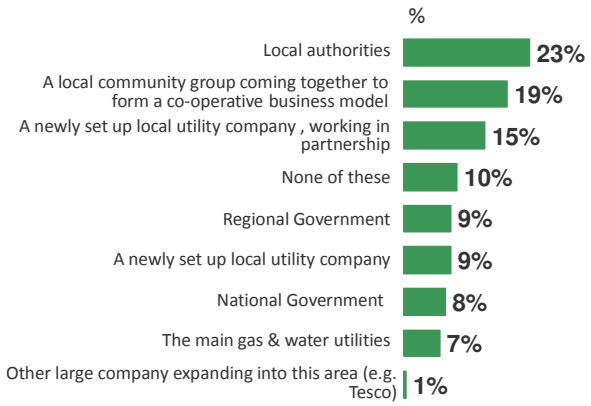


Base: 1,074 GB adults aged 18+, interviewed online, Ipsos MORI, October 2009

Turning to the day-to-day management, local authorities are the most trusted organisation (Figure 9), albeit by less than one in four (23%). Also popular are a local community group coming together and establishing a co-operative business model (19%), and a newly set up local utility, working in partnership with one of the main gas and water utilities (15%). National Government, although recognised for its capacity to play a leadership role, is not widely trusted in a management role (8%), nor are the main gas and utility providers (7%).

Figure 9. Day to Day Management: Most Trusted

Q. And which <u>one</u> of the following groups, if any, would you trust <u>most</u> to have responsibility for the day to day management and maintenance of sustainable community infrastructure?

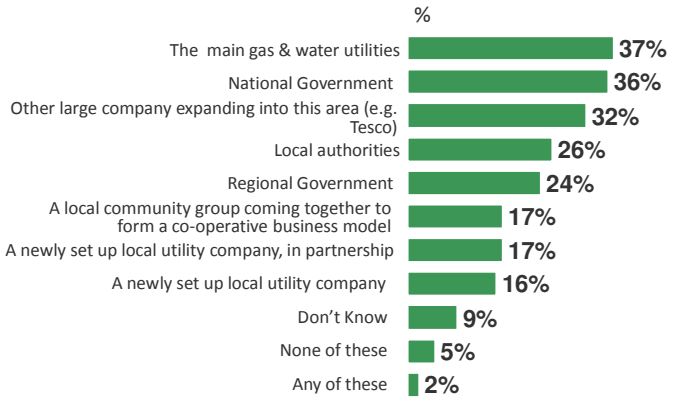


Base: 1,074 GB adults aged 18+, interviewed online, Ipsos MORI, October 2009

Indeed, apart from trust in their role by virtue of a partnership with a newly formed local utility, trust in the main utilities themselves is evidently in short supply. Figure 10 demonstrates that they are in fact the least trusted to be responsible for sustainable community infrastructure (37%), alongside national government (36%). Furthermore, a high proportion say they do not trust local authorities in a management role – interesting almost the same proportion who said they did trust local authorities at Figure 9. The same is true of most other groups and organisations, such as a local community group forming a cooperative management business model or a newly formed local utility working in partnership with one of the main utilities. In each case, the proportion of consumers who identify an organisation as their most trusted option is matched by an equivalent proportion of consumers who identify that organisation as their least trusted option.

Figure 10. Day to Day Management: Least Trusted

Q. Which of these groups, if any, would you not trust to run such a scheme?



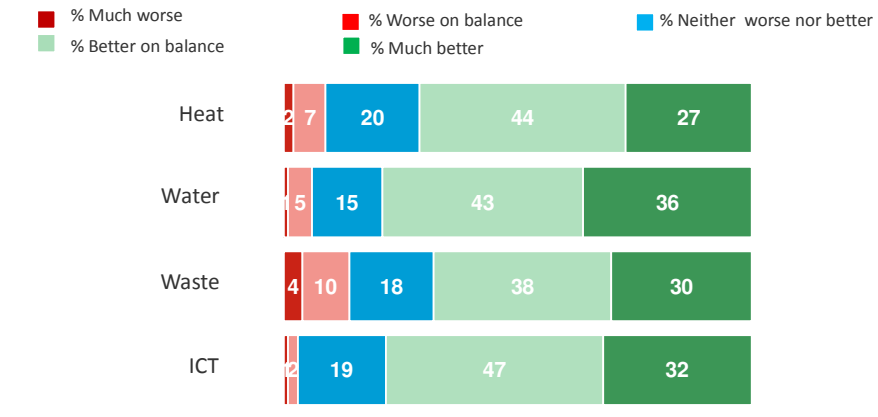
Base: 1,074 GB adults aged 18+, interviewed online, Ipsos MORI, October 2009

IV. Overall Perceptions

The survey demonstrates that, by and large, the core elements of sustainable community infrastructure that were tested – heat, water, waste and ICT - are perceived positively by a large majority in comparison to how these utilities/services are currently supplied. Figure 11 shows a very similar pattern across each of the four elements – in each case around one in three consider it to be "much better", approaching half judge it to be "better on balance", around one in five think it is "neither better nor worse", while a minority of around one in ten think it is either "worse on balance" or "much worse".

Figure 11. Rating the propositions relative to current supply

Q. Based on the above information, and compared to the way in which heat/water/ICT/waste collection is currently supplied in your property, do you think this proposition is better, worse or neither better nor worse?



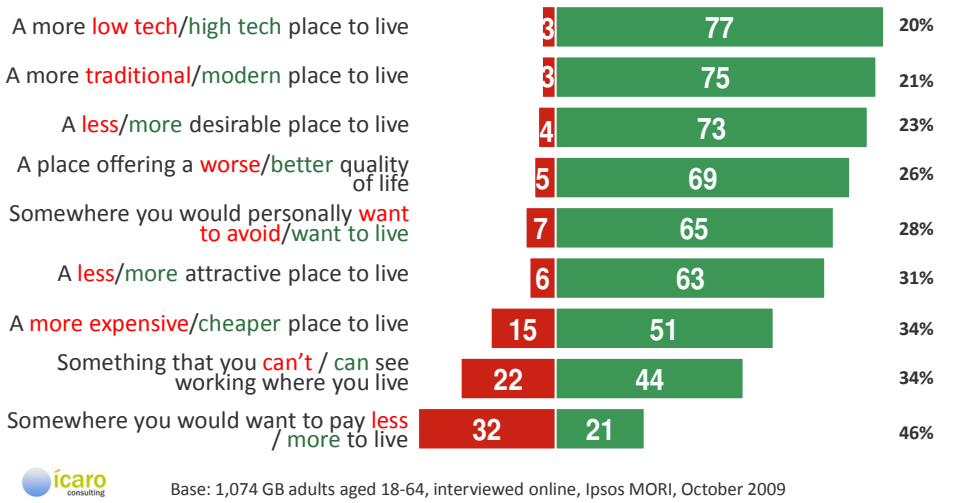
Base: 1,074 GB adults aged 18+, interviewed online, Ipsos MORI, October 2009

Turning to the 'kind of community' that consumers intuitively perceive a neighbourhood with sustainable community infrastructure to be, Figure 12 suggests that they are widely thought of as high tech, modern, attractive and desirable (retaining an element of the "eco-chic"), considered to offer a better quality of life, and be somewhere that they would personally want to live. However, the survey offers some evidence concerning two key perceptual barriers: cost and the infrastructure been able to be perceived as something that could "work in their area".

- On cost, the default perception for just over half of consumers (51%) is that these places would be cheaper areas to live, although close to one in three (34%) judge that it would be neither cheaper nor more expensive, while a minority (15%) think that it will be more expensive.
- In terms local application, perceptions are evenly split between those who can see it working for them (44%), those who can't (22%), and those who are unsure (34%).

Figure 12: What kind of place would it be to live in?

Q. In summary, do you think a neighbourhood with these kinds of sustainable community infrastructure would be…?

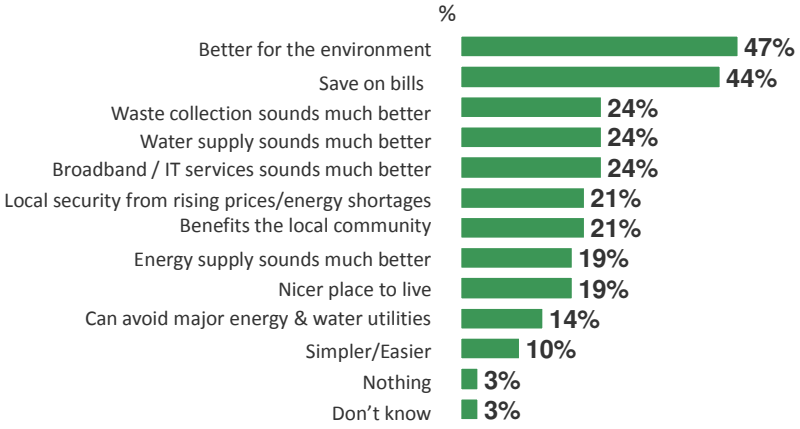


Base: 1,074 GB adults aged 18-64, interviewed online, Ipsos MORI, October 2009

Two key motivations stand out for why people say they would want to live in a neighbourhood with sustainable community infrastructure: environmental benefit (47%) and savings on bills (44%). This is followed by significant proportions of around one in four who, respectively, resonate with particular aspects of the overall proposition (Figure 13).

Figure 13. Motivations

Q. Which of the following factors, if any, would make you personally most likely to want to live in an area with sustainable community infrastructure?



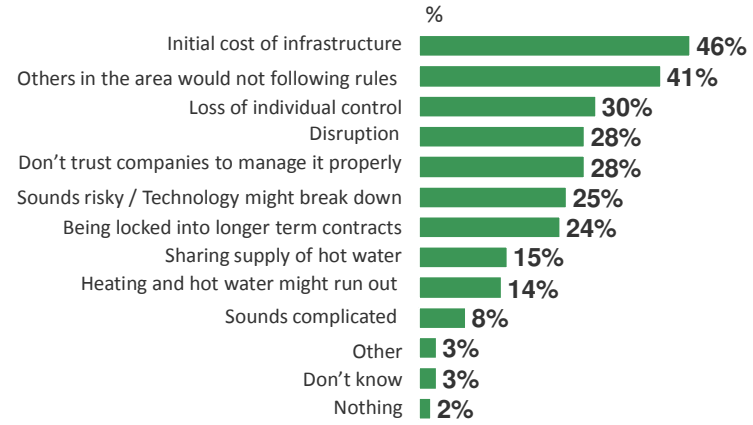
Base: 1,074 GB adults aged 18+, interviewed online, Ipsos MORI, October 2009

The prominence of environmental benefits and cost savings does require qualification, given that it is based on a prompted question format in contrast to other questions asked elsewhere in the survey (i.e. the initial, unprompted questions). For example, taking the environmental motivation first, while there is no evidence that the environmental benefits are disputed, nor that a wider section of the public clearly does identify it as an 'important issue', only 13% of consumers raised it as a spontaneous 'like' earlier in the survey. Somewhere between 13% and 47% is likely to be an important distinction between the environment as a *primary motivation* and the environment as a nice to have (but weaker) *secondary benefit*. Similarly, while cost savings are evidently a powerful motivation of human behaviour, it is worth qualifying that, elsewhere in the survey, the relatively 'slow burn' longer term savings outlined to consumers elicited some relatively mixed views.

Turning to barriers, Figure 14 reinforces some of the perceptions raised earlier (and indeed in the focus groups, see Section 3) about the initial cost of the infrastructure (46%), sharing resources with the threat of 'free riders' in the community (41%), loss of individual control (30%), disruption (28%) and a lack of trust in the management structures (28%).

Figure 14. Barriers

Q. And which of the following factors, if any, would most concern you about living in an area with sustainable community infrastructure?

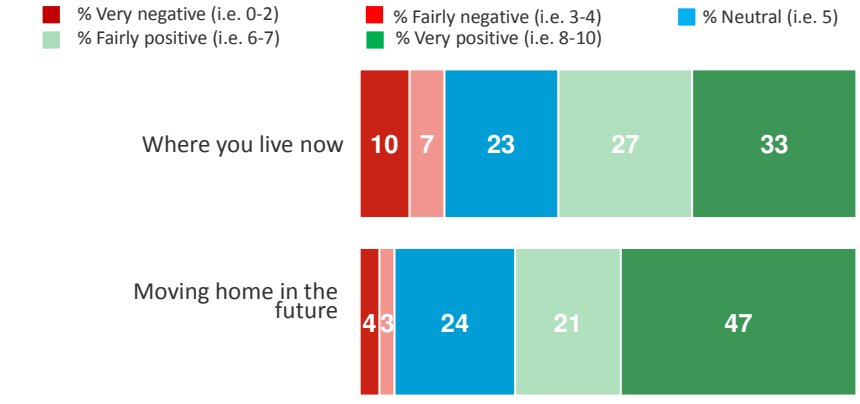


Base: 1,074 GB adults aged 18+, interviewed online, Ipsos MORI, October 2009

In summary, respondents were asked – on the basis of all that they had seen and considered – how positive, negative or neutral they are to living in a neighbourhood with sustainable community infrastructure, both in terms of retrofitting the area where they live now as well as moving home in the future. Figure 15 demonstrates that, in both instances, the balance of opinion is positive with a notably edge for new build over retrofitting – 60% say they would react positively to the area they live now being re-designed to have sustainable community infrastructure, compared to 68% who would be positive about moving to an area with the infrastructure already installed. In contrast, 17% and 7%, respectively, are negative, whereas close to one in four in both instances are neutral.

Figure 15. Overall Reactions – Existing and Future Homes

Q. In terms of where you live now, on a scale of 1-10 how positive, negative or neutral would you be if the area was re-designed and re-developed to have sustainable community infrastructure?
Q. And, thinking about moving home in the future, how positive, negative or neutral would you be about living in an area with sustainable community infrastructure already installed?



Base: 1,074 GB adults aged 18+, interviewed online, Ipsos MORI, October 2009

SECTION TWO.

Factor & Cluster Analysis

In order to explore how the findings vary across different groups in the population, Factor and Cluster statistical analysis was undertaken on the findings. This involves a two-stage process of (a) grouping together different elements of the questionnaire and groups of questions into composite 'factors' that, together, could be driving perceptions; and (b) identifying how different groups within the population form 'clusters' around these factors. The result is a **consumer segmentation model** relating specifically to sustainable community infrastructure. There are seven key factors within the survey, outlined in Table 1.

Table 1. Key Factors underpinning attitudes

Factor	Source
Water system benefits	Positivity to the features of a community water system at Q7
Heat system benefits	Positivity to the features of a community heating system at Q4
Acceptability of alternative energy sources	Acceptability/unacceptability of alternative energy sources at Q5
Heat system inconvenience	Reactions to disruption and longer contracts at Q4
ICT benefits	Positivity to the features of a community ICT system at Q11
Waste & recycling benefits	Positivity to the features of a community waste system at Q9
Gas redundancy	Willingness to go without gas in home

Based on these factors, the cluster analysis identifies **eight distinct segments** within the population. Table 2 outlines how each segment 'scores' against each of the factors (*compared to the average response across the population as a whole*). So, for example, those in Cluster 8 are marginally more positive *than average* to all the factors with the exception of alternative energy sources, which is an area they find significantly less acceptable *than average*. The need to anchor these results to 'the average' is very important, because the average results - as we have seen from Section 1 - are generally positive. Therefore, in the case of Cluster 8, the results do not suggest that consumers within this segment find alternative energy sources completely unacceptable; but rather that they find at least some of the alternative energy sources less acceptable than the population as a whole.

Table 2. Factor & Cluster Solution

	Cluster							
	1	2	3	4	5	6	7	8
Water system benefits	0.48	0.66	0.15	-0.42	0.33	0.35	-1.36	0.48
Heat system benefits	-1.55	-0.44	0.47	0.71	0.20	0.23	-0.60	0.30
Acceptability of alternative energy sources	0.21	0.20	-0.06	0.40	0.08	0.61	-0.21	-2.72
Heat system inconvenience	-0.64	-0.57	-0.18	-0.85	-0.21	1.06	0.52	0.33
ICT benefits	0.78	-1.92	-0.05	0.16	0.46	0.31	-0.49	0.36
Waste and recycling benefits	0.40	0.01	0.35	0.49	-1.33	0.39	-0.46	0.63
Gas redundancy	0.08	0.09	-1.16	0.96	-0.18	0.23	0.11	0.36

NB. Scores that have a '-' prefix indicate that the segment is more negative than average to the factor; scores without a prefix indicate that the segment is more positive than average to the factor. The larger than number away from zero the more positive/negative the response of the cluster when compared to the average response across the population as a whole.

The findings show that different segments of the population respond to quite different facets of the sustainable community infrastructure – i.e. some are positive to certain features but not others. For example, **Cluster 3**'s positivity towards the proposition is broadly in line with the average for the population as a whole, but they are notably more attached than average to having gas in the home. **Cluster 4**, by contrast, are more positive than average to the principles of the community heat infrastructure, are actually less attached to gas than average, but are more sensitive to disruption.

A key theme running throughout, bearing in mind that Section 1 has already demonstrated that the 'average' position on sustainable community infrastructure is positive, is the notion of **'contingent acceptability'**, i.e. many of the clusters are positive but this is contingent upon dealing with a specific issue around one or more features of the overall proposition (which vary from cluster to cluster). The possible exceptions to this are Cluster 6 (who are more positive than average across the board and – in being so – represent the 'Early Adopter' community) and, by contrast, Cluster 7 (who are more negative than average across several aspects).

Table 3 provides a summary of the clusters, giving them named labels and commenting of the socio-demographic and attitudinal characteristics of each group.

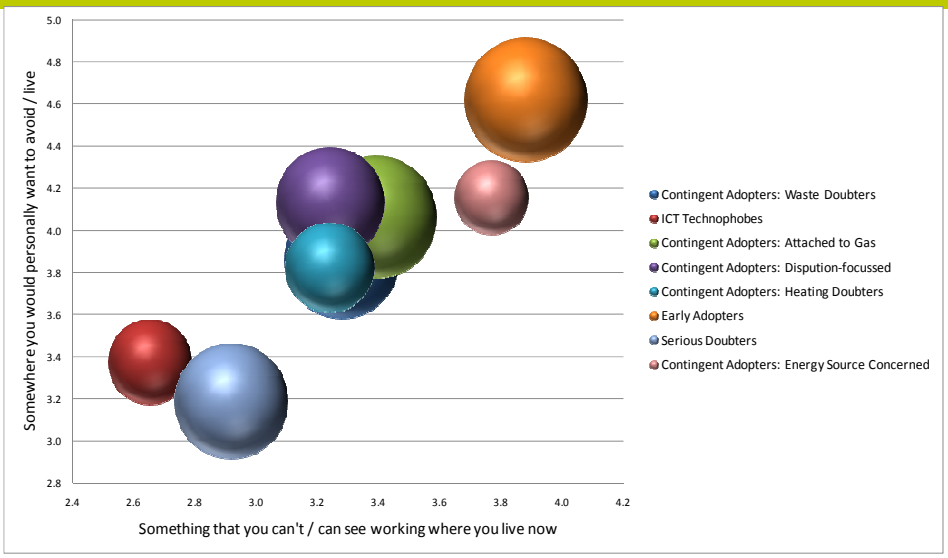
Table 3. Segment sizes, characteristics and profiles

	Cluster	Factor Profile	Socio-demographic Profile	Attitudinal Profile
Cluster1	"Contingent Adopters: Heating Doubters" - 9% of population	Low heat system benefits. Low tolerance of inconvenience. Highest ICT benefits.	Higher 45-54, lower 35-44. Lower active work status. Lower in South East/Anglia, higher London.	Most trusting of local authority. Most influenced by waste collection features.
Cluster2	"ICT Technophobes" - 8% of population	Lower than average ICT benefits. Highest water benefits.	Higher ownership outright. Lower 25-34 ages. Higher North England and South East & Anglia, Lower Scotland. Higher retired	Less favourable to retrofit of home. Lower than average desirability. Less likely to think community is 'close knit'.
Cluster3	"Contingent Adopters: Attached to Gas" - 16% of population	High attachment to gas. Above average Heat system benefits.	Higher than average outright ownership. Less likely than average to move again. Higher than average 55+. Higher than average social class.	Above average desirability. Most conscious of risks. Influenced by local approach/energy security
Cluster4	"Contingent Adopters: Disruption-focused" - 14% of population	Lower than average attachment to gas. Lower tolerance of inconvenience.	Higher than average private renting. More likely to move within 5 years. Highest 25-34 and 35-44 age groups. Higher than average women.	Above average desirability. Most likely to be influenced by a scheme that is beneficial to the environment.
Cluster5	"Contingent Adopters: Waste Doubters" - 15% of population	Lower waste and recycling benefits. Above average ICT & water benefits.	Higher ownership on a mortgage. Lower 18-24. Higher active work status. Higher London. Lower social class DE.	Most influenced by benefits to community. Most in favour of scheme led by regional government.
Cluster6	"Early Adopters" - 17% of population	Higher acceptability of alternative energy sources. Higher tolerance of inconvenience.	Higher outright ownership. Most likely to move in next 2 years. Low 18-24, High 55+. Lower social class B, higher C. Higher than average men.	Highest general desirability. Highest env-friendliness.
Cluster7	"Serious Doubters" - 15% of population	Lower water benefits. Lower tolerance of inconvenience.	Higher than average social renting. Least likely to move in next 2 years. High younger age groups. Highest Midlands, lowest South East/Anglia.	Less favourable to new build with proposed infrastructure. Lowest general desirability. Lowest env- friendliness.
Cluster8	"Contingent Adopters: Energy Source Concerned" - 6% of population	Lower acceptability of alternative energy sources. Higher waste/ recycling and water benefits.	High outright ownership. Most likely to move in 2-5 years. High 35-44, low 55+. Lower than average social class AB.	Above average desirability. Most concerned about the upfront costs. Most influenced by saving on bills.

When considering receptivity to the sustainable community infrastructure proposition *as a whole*, the different positions of segments can be presented graphically as per Figures 16 and 17.

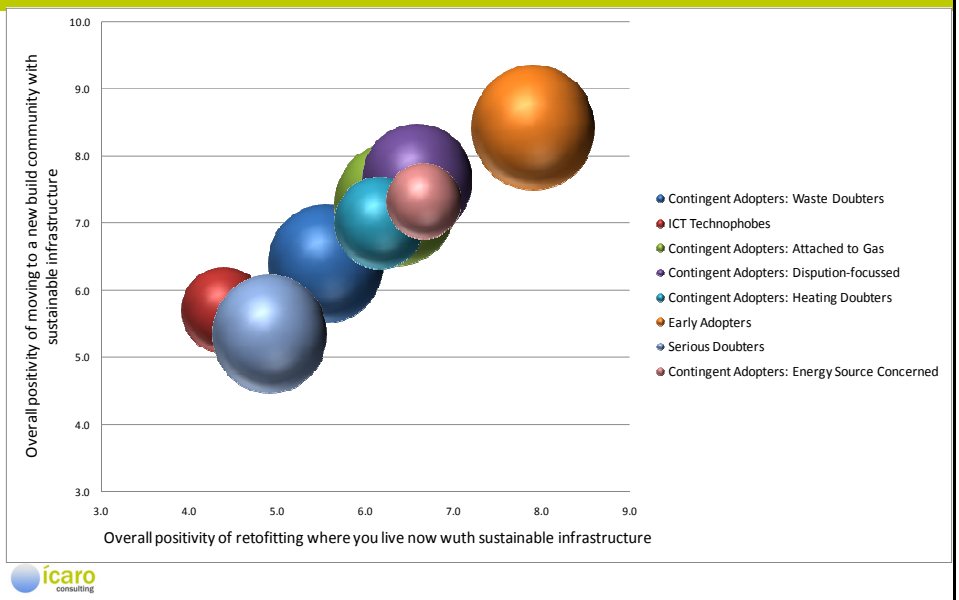
For example, Figure 16 shows how segments differ from one another according to whether they think sustainable community infrastructure *could work where they live now* as well as whether a community with sustainable infrastructure is *somewhere they would want to live*. The 'Early Adopters' are the most positive on both axis, i.e. they are most likely to think that sustainable community infrastructure could work in their area and most likely to want to live in a community with such infrastructure. In contrast, both the 'Serious Doubters' and 'ICT Technophobes' are least likely to think this (on both counts) while - living up to their billing as 'Contingent Adopters' - all the remaining segments are positioned in between.

Figure 16. Differences by Segment I



A very similar pattern is evident when considering the interplay between the acceptability of *retrofitting the area that they live now* and the acceptability of *moving into an area with the infrastructure already installed* (Figure 17). Once again there is a clear gradient, with 'Early Adopters' the most positive (on both counts), the 'Serious Doubters' and 'ICT Technophobes' generally less positive, and the 'Contingent Adopters' in between.

Figure 17. Differences by Segment II



SECTION THREE

Findings from the focus groups

I. Spontaneous Initial Reactions

The focus groups began with a broad overview of the various elements of community infrastructure, using the diagram outlined in Figure 1 (see 'Introduction') as the main stimulus material.

Initial, 'top of mind' responses among participants – both future and existing homeowners – were broadly positive (Figure 18). Participants were able to immediately pick out elements of the concept that appealed to them, and - while some were attracted by the *overall concept* - most honed in on *specific elements* that they particularly liked, disliked, or had questions.

Many of the initial spontaneous comments – in line with the findings from the quantitative survey - focused on the water elements. The rainwater harvesting element stood out for most, although others also resonated with the flood mitigation measures. Smart metering, the local organic farm, and high speed broadband were also all spontaneously picked out, and mostly in a positive light.

In terms of overarching themes, the associations between the proposition and notions of 'efficiency' and 'avoiding waste' appeared powerful. Some participants connected both of these to an underlying pro-environmental principle, but for others the themes related not to an overtly green agenda, but rather a general dislike of any kind of 'waste':

"I believe the national grid is quite leaky and so lots of the power that is generated disappears and never gets used, but if this [local energy centre] was plugged directly into local homes the energy would be used rather than wasted"
(Future homeowner, F, 25-40)

"You're using water that's coming from the sky rather than it being wasted"
(Future homeowner, F, 25-40)

A few participants raised spontaneous dislikes - notably a perception for them that it would be like a 'commune', detached from the wider area, as well as concerns about the proximity of the energy from waste plant:

"I imagine the properties wouldn't have a great deal of individuality and I like character and things being individual rather than everything looking the same" (Future homeowner, M, 25-40)

"It might put some people off that they have no choice about living close to a waste-to-energy plant and energy centre" (Future homeowner, F, 25-40)

However, the majority raised not dislikes, but rather a number of questions about the scheme - and they were very evidently seeking clarifications before deciding whether something was positive or negative. This included questions about back up systems/contingencies in the event of a failure in the system, questions about maintenance, and questions about billing, costs and the 'fairness' of charges. Some participants also evidently struggled to relate such a system back to their own house/neighbourhood, and were very keen to ask questions about the kinds of places where such schemes were already working.

Figure 18. Spontaneous reactions to sustainable community infrastructure

Immediate likes:

- Community feel/ sense of collaborative effort
- Less wasteful/more efficient, in particular through: rainwater harvesting, the local energy plant and smart metering.

Specific elements which are appealing to some:

- Local organic farm
- Flood risk mitigation measures
- High speed broadband
- Recycling scheme - aesthetically appealing and reduces smell

Immediate dislikes:

- Living in close proximity to waste-to-energy plant and organic farm
- For some, the assumption that the community would be a commune, or with generic identikit housing with an overly structured layout

Immediate questions:

- Impact of technology system failure and procedure for restoring supply
  - Would there be a back-up system, such as a link to the National Grid?
  - Who would pay for repairs?
- Maintenance set-up
  - Where would responsibility lie?
  - Would there be high maintenance costs?
- Billing set-up
  - How would energy use be monitored so that it is paid for fairly?
- Feasibility of these systems working in practice
  - How is this working in existing communities?

II. Detailed reflections

As noted above, from a very early stage in the group discussions it was evident that the initial associations with sustainable community infrastructure, although broadly positive, were actually contingent on the 'devil in the detail', i.e. while many default reactions were positive, a number of conditions, caveats and concerns were attached.

Some of the questions raised by participants were *cross cutting* and applied to the proposition as a whole, while others related to *specific elements* like heating, water, waste & recycling or ICT. The report now focuses on each in turn.

Cross Cutting issues

Cost savings - participants were, unsurprisingly, strongly motivated by cost savings, and the discussions revealed two key themes. First, in order for participants to feel comfortable about the notion of 'sharing resources' with others, they needed to feel that processes around use and billing would be 'fair' (i.e. based on actual usage of energy/water or – for repairs – based on length of time living in the community, etc). Second, while there is little doubt that cost savings would have a positive impact on participants' receptivity towards the proposition, this positivity was muted for some by the length of time it might take to realise savings, and also scepticism that any savings would not be passed on in lower bills and/or council tax reductions:

"Would the school pay for the power themselves or would everyone pay for the school? Because I have no kids so that seems unfair" (Existing homeowner, M, 25-65)

"I wouldn't want to be charged for anyone else's use of it. If it was all going through pipes is it still be monitored in the same way? I'd hate to think that they had their temperature up at 25° and we had ours down at 18°"

(Existing homeowner, F, 25-65)

"If it broke down, would they look at how long you've lived there in terms of how much you have to pay because if you've only been living there a month that would be unfair?"

(Existing homeowner, M, 25-65)

"It sounds very good but it says bills won't go down immediately so you're going to have to live there for at least a couple of years to start to feel the effects" (Existing homeowner, M, 25-65)

"What happens to council tax because at the moment they charge you some water charge and for the removal of your rubbish, so is council tax going to go right down?" (Existing homeowner, F, 25-65)

Threat of technology failure – participants tended to spontaneously conceptualise an area with sustainable community infrastructure as one that operates in total isolation from the main utility networks. This perceived absolute self-sufficiency led to a concern among some about the impact of a system failure. Whether about pipe blockages in the underground waste system or boiler failure, the default perception – based to some extent on current experience on an individual property basis – was that the repairs would take weeks rather than hours or days, causing significant local disruption:

"What's the fall back if something did break? What is your reserve? Is there a generator which you could run off for 2 days before that's repaired or is it a case that once it's broken you've got an hour left and that's it?"

(Existing homeowner, M, 25-65)

"Would it be connected to the national grid as well as a back-up to the system if something did go wrong?"

(Future homeowner, F, 25-40)

Individual control and personal choice – the issue was raised in relation to both contract length and external control over appliances (outlined under ICT). In terms of contract length, there was a sense of unease at being perceived to be "locked in" to one supplier (which was felt whether or not participants had actually changed supplier recently or not):

"It scares me that I'd loose choice of provider. Do I have the choice of who supplies my heat, or is it community heat at that price?" (Existing homeowner, F, 25-65)

"I like to be in charge of my own life and responsible for things rather than someone else making these choices"

(Existing homeowner, M, 25-65)

Case studies & normalisation – participants lacked any kind of real reference point for sustainable community infrastructure, and so they had difficulty imagining how this could work in their area. On learning of working systems elsewhere in the UK, many participants had questions about 'how it works there'. They were also evidently keen to hear about examples that are relevant to a range of community types, i.e. rural, urban, suburban, etc:

"Initially I think you need to sell this to people who are interested in doing something like this, and then you could see it working in practice and then maybe it might catch on in existing communities"
(Existing homeowner, M, 25-65)

Disruption – this issue elicited mixed views among participants. Without any prompting, some assumed that retrofitting sustainable community infrastructure would involve massive upheaval of the property, which would act as a major barrier to their desire to be part of such a system. However, moderate levels of disruption involving days rather than weeks (or even months, as several participants assumed) were considered more tolerable. Indeed, some participants were actually relatively ambivalent, noting that disruption had become a normalised part of 'daily life':

"If you were retrofitting this into an existing house, you'd have to take away all the radiators, boilers, dig up the floor boards" (Future homeowner, M, 25-40)

"I'd be far more tempted to go where it is already provided rather than go through all that upheaval"
(Existing homeowner, M, 25-65)

"Where I live they seem to be constantly digging, one day it's the gas company digging up the road and the next it's the water people digging the same hole...so it can't ever be worse than it is at the moment, there will be disruptions and you just have to live with that" (Existing homeowner, M, 25-65)

Small things matter – while participants could (and did) respond to the overall concept, more often than not they focused in on specific details or elements. Sometimes they related to a constituent element (e.g. the waste or water system), and at others it was about a very specific aspect (e.g. solar panels). Some identified issues that actually had nothing to do with the proposition, i.e. car parking allocations, or CCTV. These details, while appearing relatively inconsequential to sustainable community infrastructure, were nonetheless considered important by participants to allow them to build up a sense of what the community 'looks like' and how it caters to their lifestyles 'wants', not just those in relation to water, waste, energy and ICT.

Element-specific issues

Heating - the findings from the discussions on the heating part of the proposition (Figure 19) largely support the quantitative survey, with key likes identified as smart metering, cost savings, improved efficiency and room-specific controls; in contrast to dislikes, for some, of having to switch to electric cooking, disruption and technology risk. On the issue of gas cooking, even though some participants clearly had a preference for cooking with gas, the issue did not appear – in the discussions at least - as significant a barrier as, say, the potential for disruption or a lack of fairness in the billing. The latter raised far more questions and potential concerns.

Figure 19. Heating likes and dislikes

Immediate likes:	Immediate dislikes:
- Environment benefits - No individual boilers to maintain and service - Individual home and room heating controls - Metering so that bills are based on actual usage - Equal, or lower heating bills	- Electric cookers only - Anticipated disruption for installation (in existing communities) - Management and maintenance costs of community "boiler" - Commitment to one supplier - Impact of technology failure

Water - the propositions around water were received very positively, and rainwater harvesting in particular appeared to be a useful 'gateway issue' to gather support for other aspects of the proposition (Figure 20). However, treated recycled grey water was a more divisive issue and hinted at some generational differences. Indeed, while the older homeowner participants were relatively unfazed by the idea of using treated grey water for washing machines, for instance, the younger prospective buyers in the group were far more reluctant:

"We seem to think that all the water that comes into our house needs to be really fresh and drinkable, but in reality we only need one tap that is drinkable and then the rest just needs to be hygienic"
(Future homeowner, M, 25-40)

"I wouldn't want to wash my clothes in other peoples' bathwater. Would it have an effect on your clothes if you keep washing them in old water?" (Future homeowner, M, 25-40)

"I wouldn't really want it in the house to be honest, if you can't drink it there has to be something wrong with it"
(Future homeowner, M, 25-40)

Figure 20. Water likes and dislikes

Immediate likes:	Immediate dislikes:
- Saving on "tap water" usage - Rainwater harvesting: reduces wasted water and reduces flood risk - Use of filtered water for gardening, car washing, flushing toilets - Metered system – pay for what you use - Permeable surfaces to reduce flooding	- Grey water use for washing clothes (for some)

Waste - the proposition for waste disposal was well received in the discussions, among both the future and existing homeowners, mainly due to its aesthetic advantages over the current system (Figure 21). Support for this proposition, however, appeared to rest on fall on the actual distance to the 'in-street collection points', given the additional effort required (particularly so in terms of the elderly and/or those with a disability). Several participants literally began specifying minimum and maximum distances (e.g. no less than 10 meters to avoid smells close to home but no more than 100 meters away):

"At the moment I have green sacks that you have to leave outside your house, and it's just not a good look so the vacuum idea I think is brilliant as it keeps it out of sight" (Future homeowner, F, 25-40)

"I know some people where it is too much hard work for them to take the sack out of the bin and put it in the wheelie bin so taking the rubbish out at all is a chore" (Future homeowner, M, 25-40)

Figure 21. Waste likes and dislikes

Immediate likes:	Immediate dislikes:
- Waste separation - No kerbside wheelie bins or rubbish sacks - Waste and recycling chutes – good for smell and aesthetics - Use of waste as fuel for local energy centre	- Additional effort of depositing waste at central depot - Possibility of system failure or blockage

ICT - many aspects of the proposed ICT system were well received, including high speed broadband and smart metering (Figure 22). However, the discussions revealed an important tension concerning choice and control of these systems - while the option for an in-home hub to 'power down' the home was considered positively, the option of the community system having the ability to switch off appliances was perceived as an unacceptable intrusion of privacy:

"I like it where you can shut the house down so you are saving money because it is very easy to leave your phone charger on or your TV on standby which is wasting energy" (Future homeowner, F, 25-40)

"You're giving someone else control of your home, but your home is the only place where you can have control" (Future homeowner, F, 25-40)

"You might as well give them a key to the front door as well while you're at it" (Future homeowner, M, 25-40)

The community intranet option was considered beneficial by some but not all. Younger participants, in particular, were not convinced of the demand for such a service given the social networking sites already in existence, and were also concerned that it might undermine the value of face-to-face interactions:

"It's just one more thing to stop you actually interacting with people in real life. You have Facebook to speak to people you don't see normally but when the people are living close to you it would be nicer if you could see them" (Future homeowner, F, 25-40)

Figure 22. ICT likes and dislikes

Immediate likes:	Immediate dislikes:
- Smart metering - Faster IT and broadband services - Smart homes: Internal household energy hub	- External energy regulator

Management

The discussions around management options support the findings from the quantitative survey, in that (a) it is the issue of trust that largely drives initial, headline responses, and (b) there is very little consensus on what would be 'the best' system. For example, participants readily identified the potential profit motives as an issue, including some who thought the environment could be used as a sales pitch element, rather than an end in and of itself:

"Anyone in this isn't going to be in it for nothing, they are in it to make money, not for love" (Existing homeowner, M, 25-65)

"Somewhere along the line there is someone trying to make some money, selling houses under the guise of environmentally-friendly" (Future homeowner, M, 25-40)

A general lack of trust in the big utilities (who were, not unexpectedly, associated with generating huge profits at consumers' expense) led to a preference towards local management structures. Some, for example, considered sustainable community infrastructure as a way of returning to a more community-orientated collaborative way of life, including the idea of a system set-up and run by local people. The 'local' aspect of these plans, and importantly, their tailoring to the uniqueness of a community's situation, was a key driver of attitudes:

"I'd rather it be a local company, not one hundreds of miles away that has never been near the place and actually don't really care" (Existing homeowner, M, 25-65)

"If you think how differently people across Britain live their lives, for example how people live in Devon compared to Londoners is just totally different, so if you have parameters set by government then it may not be relevant" (Future homeowner, M, 25-40)

"Locals will know what they want and what they need rather than national government saying that this small town needs this or this when they don't know the area" (Future homeowner, F, 25-40)

A desire for these systems to be locally delivered and run was not shared by all, however. Some believed that ideals about a community pulling together around sustainable infrastructure are unrealistic and/or outdated:

"I think it's quite an airy-fairy belief that we will all be a community and everyone will get on well together and strive for the same goals" (Future homeowner, M, 25-40)

"I live in a new estate and there is a lack of community because of the different mixes of people you've got. Because people are moving all the time so you never really get to know anyone" (Existing homeowner, M, 25-65)

SECTION FOUR.

Conclusions & Implications

The research has demonstrated several clear and important insights about consumer attitudes to sustainable district infrastructure.

First, the default position for many consumers tends towards the positive, and there is no discernable evidence of any widespread or inherent dislike of the proposition. Indeed, the research demonstrates that many of the constituent elements of sustainable community infrastructure are considered – in principle at least – to be an *improvement on current services*, while the concept as a whole is considered by consumers to be *modern*, *high tech*, and *desirable*. Overall, the survey demonstrates that 60% say they would react positively to the area they live now being re-designed to have sustainable community infrastructure, compared to 68% who would be positive about moving to an areas with the infrastructure already installed.

Second, rainwater harvesting stands out as a key positive driver, followed by specific elements of the heating and ICT propositions. Broader environmental and community benefits appeal strongly to a minority but – for the majority – are not strong enough to act as primary motivations. For these consumers it is the associations with 'improved efficiency' and 'reduced waste' that come to the fore, and with these cost savings.

Third, and turning to dislikes, the research finds that there are very few immediate, default dislikes among consumers. There are some possible exceptions, most notably when consumers perceive the system to be entirely separate from the surrounding area, or specifically geared only towards social housing (and while neither of these views are mainstream perspectives, they could potentially exert a negative influence).

Rather, and most importantly, it is the concerns and questions that consumers raise about the 'devil in the detail' that really seem to matter. Although default perceptions may be positive and negative aspects relatively few in number, responses are in fact *conditional*, with most questions and concerns focused on *practicality*, i.e. "could this work in my area"?

Some of the most important questions that need to be addressed are *cross cutting*, for example:

- How long it will take for consumers to benefit from cost savings?
- What contingency measures are in place in the event of system failures?
- What measures are in place to guard against 'free riders' in the community?
- How long will disruption last (since there is a world of difference between hours and days on the one hand, and weeks on the other)?

In contrast, other questions relate to *specific elements* (i.e. heating, water, waste and ICT). Within each element there are evidently a number of facets that act as positive 'hooks' (i.e. with which consumers engaged and which reflect positively on the proposition overall), as well as a number of facets that are more divisive and potentially have the opposite impact, casting a negative light on the overall proposition. For example:

- Many of the water elements are potentially powerful, most notably *rainwater harvesting*. However, *greywater recycling* stands out as the most problematic element of the proposition - while many appear to have no problem with grey water across a range of in-home functions, many others would *only* be comfortable in relation to toilet-flushing and garden watering (while a minority – and a potentially younger consumer audience - would likely reject in-home use of grey water under any condition).

- The underground waste and recycling system is received positively but, given its relative novelty in the UK, fears about the system breaking down are also very evident, and many have questions about how far people need to walk to their nearest 'drop point'.

- The ICT propositions are also largely well received - not only the 'no-brainer' of faster broadband speeds but also the idea of smart metering and an in-home 'hub' to programme appliances and 'power down' the home. However, the qualitative research suggests there is a fundamental difference between *personal* and *external* control of the in-home systems, with the latter potentially considered very negatively.

- *Trust* underpins attitudes towards management options, although no one group or organisation receives a particularly resounding endorsement from consumers. The large utilities, in particular, suffer from a lack of trust, and while propositions involving local authorities, community co-operatives and local utilities working in partnership with the large utilities are all considered more trustworthy, they by no means convince everyone.

All of these positives, negatives and 'conditional positives' feed into a consumer segmentation model which demonstrates three key groups – *'Early Adopters'* (accounting for a substantial 17% of the public), *'Serious Doubters'* (15%), and a third, majority group of *'Contingent Adopters'* (which can itself be broken down into different types of contingent adopter).

In terms of key next steps, those responsible for delivering community infrastructure will need to match different propositions to different communities. These research findings, and the segmentation model, provide the means to support this process and enable different 'packages' to be built (and communicated). Moreover, and as a final reflection, this research reinforces the findings of the *Big Energy Shift* in that many of these questions and concerns could be satisfied to an extent by an expansion in the number of UK-based examples, covering a range of different *spatial scales* and *neighbourhood types*. The lack of any kind of 'reference point' for consumers undoubtedly drives many of the concerns about practicality that will need to be overcome.

APPENDICES

1. Topline survey results

- The results are based on all respondents (1,074)
- Where percentages do not add to 100% this is due to computer rounding of the raw data
- The data are weighted by gender, age and working status to achieve a nationally representative sample.

Q1. **On the basis of what you have just read and seen in the diagram, what aspects, if any, did you like most?** [NB. Spontaneous responses subsequently coded]

	%
WATER FEATURES (NET)	37%
- Collecting / using rainwater	31%
- Avoid flooding	8%
ENERGY/HEATING FEATURES (NET)	25%
- Community heating network	7%
- Energy from waste	7%
- Smart metering/digital readouts	6%
- Efficient	4%
- Local energy centre	3%
WASTE FEATURES (NET)	23%
- Community recycling	13%
- Underground system	6%
ENVIRONMENTAL BENEFIT (NET)	13%
- Good for the environment	5%
- More sustainable	3%
- Reduces carbon / lower carbon footprint	3%
- “greener” living	1%
- Using resources efficiently	1%
HOUSING FEATURES (NET)	10%
Newly built low carbon homes	6%
Retrofitting existing homes	4%
Social housing	2%
COMMUNITY BENEFITS/”FEEL”	8%
COST SAVINGS	7%
ICT FEATURES (NET)	6%
- High speed broadband	6%
ORGANIC FARM	5%
Comments on picture design, not content	2%
Other miscellaneous	5%
Everything	3%
Nothing	8%
N/A	2%
Don’t know	1%

Q2. **And which aspects, if any, did you not like?** [NB. Spontaneous responses subsequently coded]

	%
PRACTICALITY (NET)	17%
- Disruption	5%
- Unrealistic / would never work in practice	5%
- Would not work in my area	5%
- Theory ok but need practical examples	2%
- Layout wrong / business too close to housing	2%
HOUSING FEATURES (NET)	9%
- Social housing	6%
- Retrofitting existing homes	2%
- Newly built low carbon homes	1%
COSTS (NET)	8%
- Upfront costs	6%
- Pay back too long	2%
WASTE FEATURES (NET)	8%
- Community recycling won't work	4%
- Underground system breaking down	4%
- Waste to energy	1%
HEATING/ENERGY FEATURES (NET)	7%
- Community network	4%
- Local energy centre	1%
- Smart metering	1%
ORGANIC FARM	3%
MANAGEMENT CONCERNS	2%
ICT FEATURES (NET)	1%
WATER FEATURES (NET)	1%
Comments on picture design, not content	1%
Other miscellaneous	1%
Everything	1%
Nothing	32%
N/A	4%
Don't know	1%

Heating

Q3. **Based on the above information, and compared to the way in which heat is currently supplied in your property, do you think this proposition is better, worse or neither better nor worse?**

	%
Much better	27
Better on balance	44
Neither better nor worse	20
Worse on balance	7
Much Worse	2
Better	71
Worse	9

Q4. **Picking up on some of the common features of a sustainable community heat system, to what extent do you personally consider each to be positive, negative or neutral?**
[Scale of 0 – 10 with 0 being very negative, 5 being neutral and 10 being very positive]

	0-2 %	3-4 %	5 %	6-7 %	8-10 %	Positive %	Negative %
Giving the UK greater security of supply over energy resources	1	2	17	21	58	79	3
Enabling you to live a 'greener' lifestyle	3	3	16	21	58	79	6
Making sure that everyone in the community is living a 'greener' lifestyle	3	2	16	23	56	79	5
Purchase and maintenance of equipment is the responsibility of the local supplier, not individuals	5	4	17	21	53	74	9
Having greater local independence in terms of energy supply	3	3	21	25	47	72	6
Linking up the system to businesses, public buildings and local schools to ensure they also benefit from, and help pay for, the local system	5	3	19	25	47	72	8
Cost savings over time but not necessarily immediately	6	9	22	28	35	63	15
Not having an individual boiler in the home and sharing a larger boiler serving multiple properties	17	12	26	17	29	46	29
Moving to a 12 or 18 month contract with the local supplier	13	13	37	16	21	37	26
Minor disruption to individual properties	13	19	34	14	20	34	32
Some disruption in the local area as new utilities are installed	13	20	34	16	17	33	23
Having to have an electric, rather than gas, cooker	30	12	31	10	18	28	42

Q5. **The local energy centre could be fuelled by various sources of energy, either one source or a combination. How acceptable or unacceptable do you think the following would be for your local area?**

	Very acceptable %	Fairly acceptable %	Neither acceptable nor unacceptable %	Fairly unacceptable %	Very unacceptable %
Biomass boilers, burning wood / wood chips	23	31	30	11	5
Gas	20	34	32	9	5
Energy from waste 1 - taking organic waste (e.g. food, sewage and garden waste) created in the local area, diverting from landfill, and converting this into compost and energy	46	31	14	4	4
Energy from waste 2 - taking general waste created in the local area, diverting from landfill, and burning this in controlled conditions to create energy	39	32	17	7	5
A series of ground source heat pumps that capture and use heat from beneath the ground	46	29	17	4	5
A series of solar panel arrays	45	29	15	6	4
A series of wind turbines	28	30	20	13	9

Water

Q6. **Based on the above information, and compared to the way in which water is currently supplied in your property, do you think this proposition is better, worse or neither better nor worse?**

	%
Much better	36
Better on balance	43
Neither better nor worse	15
Worse on balance	5
Much Worse	1
Better	79
Worse	6

Q7. **Picking up on some of the common features of a sustainable community water system, to what extent do you personally consider each to be positive, negative or neutral?**
[Scale of 0 – 10 with 0 being very negative, 5 being neutral and 10 being very positive]

	0-2 %	3-4 %	5 %	6-7 %	8-10 %	Positive %	Negative %
Using filtered rainwater for things like flushing toilets and watering gardens	1	1	9	13	76	89	2
More local green spaces that - among other things absorb excess water	*	1	10	17	72	89	1
Saving on water use 'from the tap'	1	1	12	19	68	87	2
Using treated recycled water (e.g. from showers) for things like flushing toilets and watering gardens	2	3	11	15	69	84	5
Having permeable paving rather than tarmac in parking areas and driveways to reduce flooding	2	2	12	18	66	84	4
Giving the UK greater security of supply over water resources	1	1	15	17	65	82	2
Having greater local independence in terms of water supply	2	1	21	20	55	75	3
Using filtered rainwater for things like washing machines	6	7	14	15	58	73	13
Having a water meter so you are charged based on how much you use	9	3	18	14	56	70	12
Using treated recycled water (e.g. from showers) for things like washing machines	10	9	16	16	49	65	19

Waste

Q8. **Based on the above information, and compared to the way in which recycling and waste is currently collected, do you think this proposition is better, worse or neither better nor worse?**

	%
Much better	30
Better on balance	38
Neither better nor worse	18
Worse on balance	10
Much Worse	4
Better	68
Worse	14

Q9. **Picking up on some of the common features of a sustainable community waste system, to what extent do you personally consider each to be positive, negative or neutral?**
[Scale of 0 – 10 with o being very negative, 5 being neutral and 10 being very positive]

	0-2 %	3-4 %	5 %	6-7 %	8-10 %	Positive %	Negative %
Local waste is used as a local source of energy, diverting it from landfill	1	1	10	17	70	87	3
There are no restrictions on the amount of recycling and rubbish that residents drop off	3	3	13	15	67	82	6
The materials are largely dealt with underground reducing the need for storage in street and collections	6	3	16	20	55	74	9
It has to be separated into 3 types - recyclables, organic waste & rubbish	5	7	21	19	47	67	12
Residents take waste and recycling to local street collection points	18	14	21	18	29	47	32

Information and Communications Technology

Q10. **Based on the above information, and compared to the way in which ICT and metering services are currently supplied to you, do you think this proposition is better, worse or neither better nor worse?**

	%
Much better	32
Better on balance	47
Neither better nor worse	19
Worse on balance	2
Much Worse	1
Better	79
Worse	3

Q11. **Picking up on some of the common features of a sustainable community ICT system, to what extent do you personally consider each to be positive, negative or neutral?**
[Scale of 0 – 10 with o being very negative, 5 being neutral and 10 being very positive]

	0-2 %	3-4 %	5 %	6-7 %	8-10 %	Positive %	Negative %
Faster IT and broadband services	1	1	13	10	76	86	2
In-home smart meters that give more accurate information on energy and water use in the home	3	1	12	19	64	84	4
Having a central inhome 'hub', which can be programmed to switch them on and off when not in use, or to 'power down' your home when you leave	3	2	14	17	64	81	5
Real time monitoring across the community to make sure energy supply meets demand, including the option for the community system to switch off specific appliances in your home to save energy	9	5	17	20	48	69	15
A community intranet where you can exchange data and information about community activities with other members of the community	8	6	29	24	33	57	14

Management & Leadership

Q12. **Which one of the following groups, if any, do you think should be responsible for leading on the idea of sustainable community infrastructure?**

	%
Local authorities	24
National Government	20
A local community group coming together to form a co-operative business model	14
A newly set up local utility company, working in partnership with one of the main gas and water utilities	13
Regional Government	10
The main gas and water utilities (e.g. British Gas, EDF Energy)	7
A newly set up local utility company	7
None of these	3
Other large companies expanding into this area (e.g. Tesco)	1

Q13. **And which one of the following groups, if any, would you trust most to have responsibility for the day to day management and maintenance of sustainable community infrastructure?**

	%
Local authorities	23
A local community group coming together to form a co-operative business model	19
A newly set up local utility company, working in partnership with one of the main gas and water utilities	15
None of these	10
Regional Government	9
A newly set up local utility company	9
National Government	8
The main gas and water utilities (e.g. British Gas, EDF Energy)	7
Other large companies expanding into this area (e.g. Tesco)	1

Q14. **Which of these groups, if any, would you not trust to run such a scheme?**

	%
The main gas and water utilities (e.g. British Gas, EDF Energy)	37
National Government	36
Other large companies expanding into this area (e.g. Tesco)	32
Local authorities	26
Regional Government	24
A local community group coming together to form a co-operative business model	17
A newly set up local utility company, working in partnership with one of the main gas and water utilities	17
A newly set up local utility company	16
Don't Know	9
None of these	5
Any of these	2

Final Reflections & Outcomes

Q15. **In summary, do you think a neighbourhood with these kinds of sustainable community infrastructure would be…?**
[Standard 5 point scale for each, e.g. 1 = much more desirable, 3 = neutral/neither; 5 = much less desirable]

	1 %	2 %	3 %	4 %	5 %	Positive %	Negative %
A more 'high tech' place to live / a more 'low tech' place to live	41	35	20	3	1	77	3
A more modem place to live / a more traditional place to live	44	31	21	2	1	75	3
A more desirable place to live / a less desirable place to live	44	29	23	3	1	73	4
A place offering a better quality of life / a place offering a worse quality of life	36	33	26	4	1	69	5
Somewhere you would personally want to live / somewhere you would personally want to avoid	38	28	28	4	3	65	7
A more attractive place to live / a less attractive place to live	33	30	31	4	2	63	6
A cheaper place to live / a more expensive place to live	26	26	34	9	6	51	15
Something that you can see working where you live now /something that you can't see working where you live now	21	23	34	11	11	44	22
Somewhere you would want to pay more to live / somewhere you would want to pay less to live	7	14	46	21	11	21	32

Q16. **Which of the following factors, if any, would make you personally most likely to want to live in an area with sustainable community infrastructure?**

	%
Better for the environment	47
Save on bills	44
Waste collection in particular sounds much better	24
Water supply in particular sounds much better	24
Broadband/IT services in particular sound much better	24
Local security from rising prices and/or shortages in energy	21
Benefits the local community	21
Energy in particular sounds much better	19
Nicer place to live	19
Can avoid major energy and water utilities	14
Simpler/easier	10
Nothing	3
Don't know	3
Other	*

Q17. **And which of the following factors, if any, would most concern you about living in an area with sustainable community infrastructure?**

	%
Initial cost of the infrastructure	46
Other people in the area would not follow the rules	41
Loss of individual control	30
Disruption involved in putting the system in	28
Don't trust companies to manage it properly	28
Sounds risky / technology might break down	25
Householders could get locked into longer term contracts with the supplier	24
Having to share the supply of heat and hot water	15
Heating and hot water might run out	14
Sounds complicated	8
Other	3
Don't know	3
Nothing	2

Q18. **In terms of where you <u>live now</u>, on a scale of 1-10 how positive, negative or neutral would you be in the area being re-designed and re-developed to have sustainable district infrastructure?**
Scale: 0 (very negative); 5 (neutral); 10 (very positive)

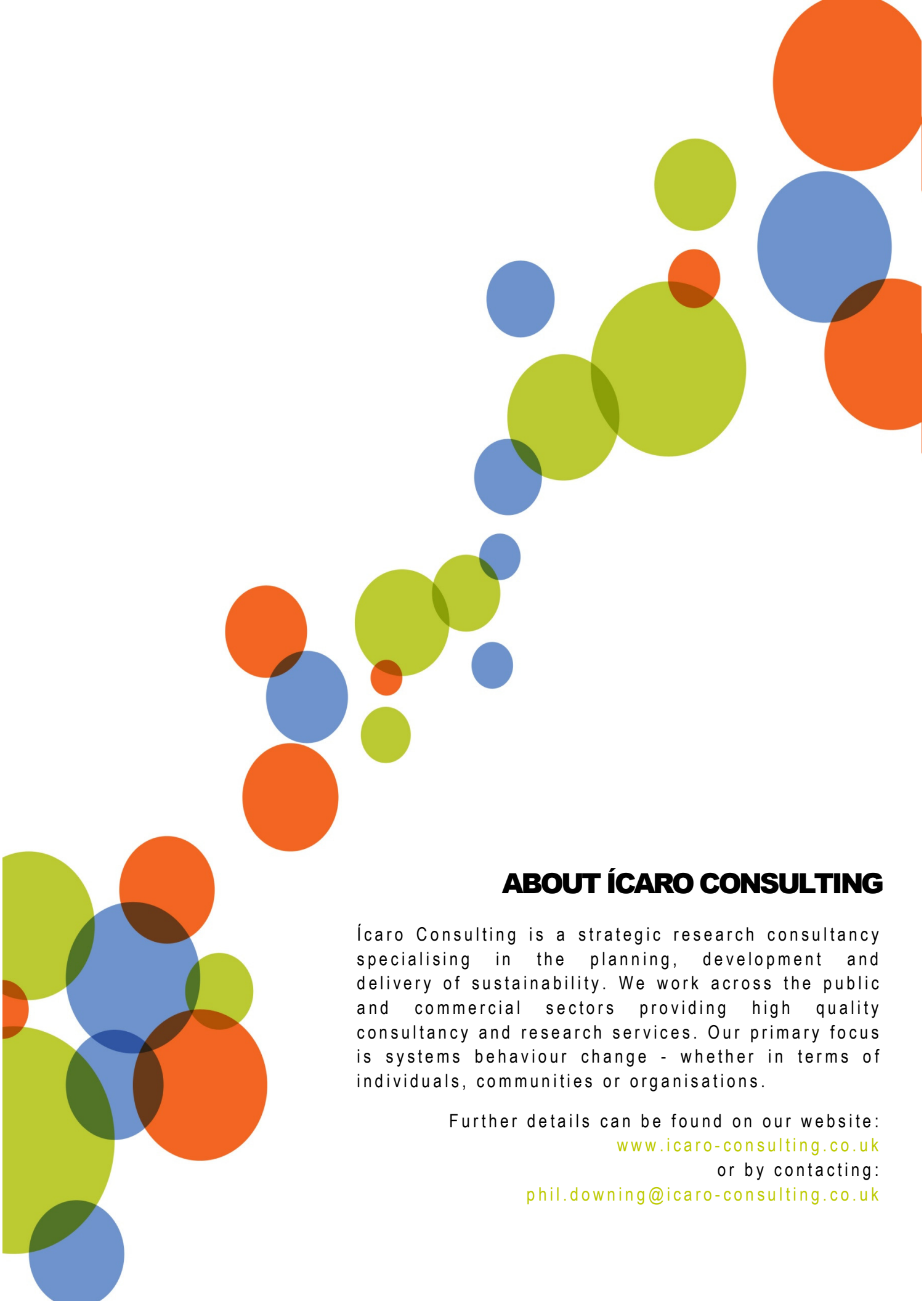
0-2	3-4	5	6-7	8-10	Positive	Negative
%	%	%	%	%	%	%
10	7	23	27	33	60	17

Q19. **And, thinking about <u>moving home in the future</u>, how positive, negative or neutral would you be in living in a location which has sustainable district infrastructure already installed?**
Scale: 0 (very negative); 5 (neutral); 10 (very positive)

0-2	3-4	5	6-7	8-10	Positive	Negative
%	%	%	%	%	%	%
4	3	24	21	47	68	7

Q20. **Based on what you have heard, do you think sustainable district infrastructure is…?**

	%
More appropriate for future 'new build' communities	59
Equally appropriate for both	29
More appropriate for existing communities	5
Don't know	4
Not appropriate for either	3



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Ícaro Consulting is a strategic research consultancy specialising in the planning, development and delivery of sustainability. We work across the public and commercial sectors providing high quality consultancy and research services. Our primary focus is systems behaviour change - whether in terms of individuals, communities or organisations.

Further details can be found on our website:
www.icaro-consulting.co.uk
or by contacting:
phil.downing@icaro-consulting.co.uk