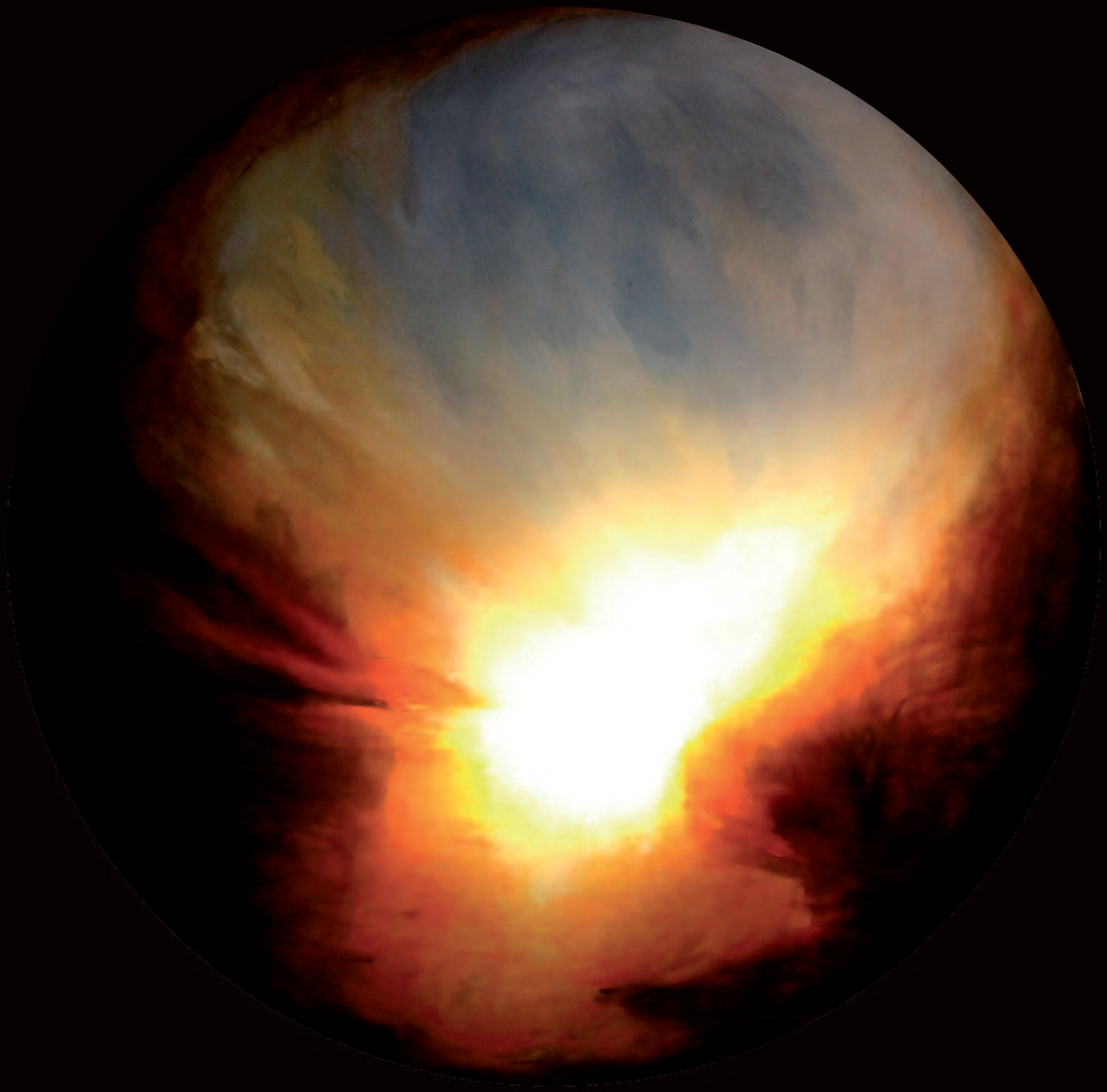
A report sponsored by Eaga

Getting Warmer?

Homes, energy efficiency and microgeneration in the UK



Artist: www.marialuisahernandez.com

Andy Schofield, Jan Rosenow and Jim Barker

June 2010

Cover image supplied by the Greening Campaign.

Before the final sunset... One planet, one chance. Together we can.

GREENING CAMPAIGN

CONTENTS

> What I wish to emphasise is the duality of human requirement when it comes to the question of size: there is no single answer...
>
> For every activity there is a certain appropriate scale, and the more active and intimate the activity, the smaller the number of people that can take part, the greater is the number of such relationship arrangements that need to be established.

E F Schumacher, Small is Beautiful

ACKNOWLEDGEMENTS

The authors would like to thank all of those who contributed to this research.

The following people provided many helpful insights at interview:

Andrew Cooper, Kirklees Council

Chris Welby, Good Energy

Clare Dudeney, UK Business Council for Sustainable Energy

David Clark, Mainstay Group

Drew Johnson, Willie MacDiarmid and Mitesh Dhanak, Eaga plc

Jeff Masters, 2020 Public Services Trust

Justine Prain, Energy Saving Trust

Nick Eyre, Environmental Change Institute, University of Oxford

Olivia Powis, National Housing Federation

Prashant Vase, Consumer Focus

Terena Plowright, Greening Campaign

Wendy Baverstock, Groundwork London

This report would not have been possible without their input.

The team would also like to thank others who provided information and suggestions which helped to inform the writing.

Abi Levitt and Debbie Scott of Tomorrow's People

Mel Grech, independent consultant

Patrick Shine, Shaftesbury Partnership

Eaga staff who supplied additional comments and suggestions

We are grateful to Nathan Oxley for editing the report and to Andy Moore for his additional comments.

The researchers gratefully acknowledge the financial support of Eaga plc, who provided the funding for this work. Please note that any errors or omissions are solely the responsibility of the authors. The views stated in this document are those of the authors and should not be taken to represent either the views of the contributors or the views of Eaga plc.

The environment is everything that surrounds us. Environmental problems by their very nature impact the lives of citizens and the pockets of governments as well as flora and fauna. Making houses greener and more efficient will raise people out of poverty, cut government spending and increase quality of life for all. This is a complex issue but we have the knowledge to make good choices that can and should be implemented now. Even in the current adverse economic environment, by pooling existing funding, public and private finance can pay for changes that will transform state and society. What is needed is not new thinking or new technologies so much as the impetus to accomplish this much needed transformation. This report proposes a coming together of policy makers and practitioners and outlines steps from where we are now to where we need to go.

PRAISE FOR GETTING WARMER

"In the face of public spending austerity, this paper arrives at a time when we are being forced to reflect on what it is we value in society and question whether we can really summon the resources to pay for the kind of living to which we have so far been accustomed. Laid out here is a comprehensive and lucid set of arguments that emphasise how the path towards energy sustainability and efficiency doesn't have to be one steeped in negative trade-offs. Rather, the drive towards sustainable living is a journey completely compatible with living a more fulfilling and enjoyable life. It is by adopting an approach which combines pragmatism and innovation alongside a deep commitment to social fairness and responsibility, and which mobilises individuals, communities and organisations of all sectors, that we can improve our lives, strengthen our communities and fulfil our obligation to our planet and its future inhabitants."

Matthew Taylor, Chief Executive, RSA

"This report highlights some of the thorny but vital issues we need to tackle if we are to persuade individuals of the need to change our energy use with initiatives such as a Green Investment Bank. Eaga have produced a welcome addition to the debate on how we step up the pace of change in home energy efficiency."

Dr Neil Bentley, Director for Business Environment, CBI

> This report will aid the key players who have to translate political ambitions into detailed policies into practice. Unless we take a holistic approach and match up the different policy drivers we shall not achieve the twin goals of warming and greening our homes and the imperatives of ending fuel poverty and reducing CO_2 emissions. The report identifies the main challenges to progress - the lack of knowledge and trust from consumers to create demand for improved energy efficiency standards in the home or at a community level; the complexity of existing arrangements; and the need for finance mechanisms that are equitable and work for all sectors. It adds to the hard thinking that is needed if we are to succeed in finding new progressive frameworks to tackle climate change and poverty.

Jenny Saunders, Chief Executive of NEA

> This positive, timely, and eminently practical report recommends a suite of clear and workable measures, operating at multiple scales and integrated across currently separate policy domains, through which we can take on this challenge. Their adoption would significantly empower householders to become responsible producers and consumers within more sustainable and equitable systems of energy provision. They reflect a vision that transforms the decarbonisation of our energy systems from a dangerous burden into an opportunity for individual and community action towards greater social justice and improved quality of life

Dr Tom Henfrey, Durham Energy Institute, Durham University

With 25 million existing homes to be 'greenfurbished' by 2050, the gauntlet has been thrown down and the response is slowly gathering pace. This report outlines many of the key issues involved.

A code for sustainable refurbishment should be one of the first things on the housing minister's desk because the existing housing stock is the elephant in the room and the sooner central government highlights and faces this, the better. The need to support local solutions through community groups, co-operatives and local suppliers is vital to help people help themselves. The big business flooding into this area will always have a hurdle of trust to leap whereas big society could circumvent this. In many ways, if 'Big Society' is going to work then this area must be part of its heartland.

Timely and insightful, this report should be noted and acted on.

Charlie Luxton, architectural designer and broadcaster

The recommendations in Getting Warmer are not just good ideas, they are an absolute must if we are to get ourselves out of our looming energy crisis. They are also a brilliant way of helping low income families and communities to manage in the face of steeply rising energy costs. They are the only way of protecting our fragile environment in one of the most crowded countries in the world and they are also very, very good for small builders, that army of workers who need more training and who need the confidence in future business to take on young apprentices from among those thousands of young people currently denied any opportunity to work.

This report is a very big step forward from an organisation that has worked hard to reach low income communities, to support energy generation from renewable sources and to wrap up our houses in thick blankets to avoid the need for burning precious oil. I really hope the government and energy companies and builders will take it seriously.

Professor Anne Power, London School of Economics

FOREWORD

For twenty years, Eaga has been working to improve the energy efficiency of low income households. Although much has changed, the original drive of the company to make a positive difference environmentally and socially remains consistent.

In commissioning this report we wanted to enlarge our own understanding and have an eye to the future. We wanted to explore some of the broader changes that are under way, such as shifts in finance and an increasing move towards localism, manifested for instance in the Total Place pilots. Within this, we want to know how it might be possible to remove barriers and encourage the wider adoption of domestic energy efficiency and microgeneration in existing homes, a market in which Eaga is actively engaged.

In our view, both our business and the green services sector more generally need to recognise the breadth of the challenge posed by climate change, unstable energy prices and fuel poverty. The authors' approach has been to make the connections between these issues and to relate these to wider challenges and opportunities. It is to be hoped that this goes some way to building bridges between some of the more specialist aspects of the debates around energy efficiency, microgeneration and fuel poverty as well as those with interest in the issues but perhaps a different grounding – the provision of local services, housing, employment and training – practitioners and policy makers alike.

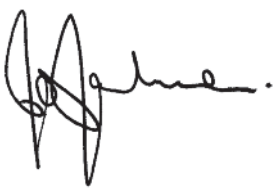
Too often environmental issues have been subject to an erroneous separation of people and planet. The environment is reduced to climate change, and climate change is categorised as too difficult, both politically and in terms of delivery. In a climate of cuts, there is a risk that these issues are seen as of little relevance. Nothing could be further from the truth.

We would like to see solutions which are inclusive, as government and the markets enable people from all walks of our society to support reductions in fuel poverty and carbon emissions, at the same time as working to help people understand the effects of their actions, encouraging behaviour change so that everyone can play a part in reducing consumption. We think there are some fantastic opportunities to make a positive contribution. There are also considerable challenges. Delaying on meeting these means that adverse effects on people and the environment will go deeper and last longer.

We expect change to come about through the collaboration of different types of organisation at different scales, since no one body or group can unlock the solutions. It will have to be supported by changes in the way we think about money. Whilst the green investment bank could be a valuable part of the solution, the use of social finance mechanisms, combined with reforms to the tax system and elements of subsidy, as well as "spend to save" activity by government, are more likely to make a collective difference than we are to find a silver bullet.

I welcome this report and hope that it will contribute to broadening and connecting the debate on these issues as ones which affect us all. They are not only as pressing as the financial challenges but they are integral to the way ahead. Doing homes well – for and with people who live in them – will have significant benefits for our society and country. To fulfil expectations of homes which are warm, healthy and affordable requires us to join up the dots. Energy efficiency and microgeneration can become the starting point for realising multiple opportunities: improving people's health, increasing household income, developing new skills and creating meaningful employment, with the promise of stronger social relationships as different groups co-create a better future for themselves, with the help of all sectors.

This report has both reflected and informed some aspects of our thinking. Eaga, like the authors, recognises the diversity of views that are out there and it is not possible to do justice to all areas in a relatively short space. But we hope that it is a helpful spur to debate and action. Please join us in discussing, shaping and delivering the solutions that will have far reaching effects in terms of quality of life for the UK's communities, stemming from the transformative potential of a more holistic approach to domestic energy efficiency and generation.



Drew Johnson
Chief Executive
Eaga

SUMMARY OF RECOMMENDATIONS TO GOVERNMENT

	Now (before March 2011)	Medium term (2011 and 2012)	Later (2013 onwards)
Review	• Interdepartmental working group to align policies and oversee an independent review of opportunities for joint action.	• Analyse the options for an area based approach, based on costs and benefits (2011) • Identify if and how changing the behaviour of consumers can be factored into public sector contracts (2011) • Consider commissioning models which use a Social Impact Bond and franchising (2011)	• Explore an outcomes based funding model for reduced fuel poverty and improved health
Regulate and commission	• Changes to Feed in Tariffs, smoothing the transition of the scale between different sized installations and introducing basic energy efficiency requirements • Means test Winter Fuel Payments and divert saved money to improving housing	• Include stipulations on training and employing newly and long term unemployed people in commissioning the new public sector programme(s) • Require bidders to also offer benefit maximisation advice as part of fuel poverty initiatives	• Develop progressive fiscal incentives • Introduce a Code for Sustainable Refurbishment, binding across all housing tenures and aligned with carbon reduction targets
Implement	• Certify suppliers of energy efficiency measures along the lines of microgeneration • Develop a voluntary energy efficiency standard for refurbishment • Government to share information on poorer households and worst performing properties with programme deliverers	• Establish a green infrastructure bank, as per the government's stated intention • Use the bank to provide low cost loans for microgeneration and energy efficiency improvements	• Establish a cross departmental programme to identify integrated social, environmental and economic benefits arising from low carbon housing and neighbourhoods
Effects	• Greater uptake of energy efficiency and microgeneration measures • Low cost improvements in targeting and to the physical fabric of properties for those at risk of fuel poverty • Greater consumer confidence in the marketplace for energy efficiency products	• Co-ordinated policy response and corresponding funding based on review work • Affordable financing for consumers and communities to improve their properties via the green infrastructure bank	• Revised tax system which incentivises improvements • Progressively tightening regulation to ensure the comprehensive retrofit of all stock

EXECUTIVE SUMMARY

We need to make homes in the UK more energy efficient and increasingly we need to power them with renewable and low carbon sources of energy. Greenhouse gas emissions from domestic buildings amount to a quarter of all UK output, providing a strong environmental rationale for action, and there is a national policy commitment to reducing them. Furthermore, poorer and more vulnerable members of society with poor quality housing are penalised with higher bills and less healthy living environments; this needs to be corrected for reasons of social justice. And, thirdly, international fluctuations in energy prices – which in turn affect everyone's ability to pay for energy – provide an added incentive to explore ways of reducing our energy use or generating it differently. An active programme of domestic retrofit to improve energy efficiency and install micro and community generation technologies is therefore essential.

This report, commissioned and funded by Eaga, seeks to identify the issues at work and possible levers for change. The research team reviewed policy and existing literature, identified case studies and undertook interviews with practitioners and academics from a range of sectors. The information was used to build up a picture of the policies and the progress which they have fostered. In so doing, barriers and weaknesses within the current framework, as well as some promising ideas, were grouped into a series of themes with corresponding recommendations.

The first theme was that policy coherence is required to support delivery. Policy has tended to operate in an "either/or" fashion, emphasising one of generation or energy efficiency. A "whole house" approach which considers these factors together to determine the right measures for each property is generally accepted as the way forward but work needs to be done so that policy supports this. For instance, subsidies for generating energy are not used to encourage energy efficiency. There is a break point when existing policies draw to an end in 2012/2013, which provides an excellent opportunity to simplify the current system and promote integration.

Secondly, there is a need to make markets work. Stimulating demand for energy efficiency and microgeneration products is part of this, although regulation will need to be introduced so that late adopters eventually comply. This is particularly necessary to improve private rented housing, where occupants' ability to make changes is restricted. Consumer confidence also needs to be bolstered by means of nationally certified advice and installation so that purchasers are not put off by the difficulties of making the right decision or choosing a suitable installer. The development of a mandatory Code for Sustainable Refurbishment is suggested for the medium term.

In the section on "Who pays?" the proposal for a green investment bank is welcomed. In addition, greater exploration of ideas such as government commissioning local franchise models or introducing a "Social Impact Bond", where government pays private investors on the accomplishment of the outcomes as is already being tested by the Ministry of Justice, will help make more money available. Whilst tax incentives are one way to encourage uptake of energy efficiency and microgeneration by the better off, equity remains a major issue here: it is essential to widen the reach of schemes beyond the able to pay and include those who can pay in part or not at all.

Modifying people's behaviour to reduce energy consumption is one of the most necessary and challenging aspects. Progress has been made and useful work has been undertaken by DECC and Defra, but there is still much to be done. Mass marketing needs to be supplemented by more targeted work, including local schemes which draw on the power of social capital at community level. Ideally, behaviour change should be considered alongside physical changes and potentially incorporated in future government programmes.

EXECUTIVE SUMMARY Continued

In exploring the idea of appropriate scale for solutions, it becomes clear that tackling the challenges of retrofit will require action on multiple levels, with roles at national, regional and local levels. None should be over emphasised and competence is likely to be a much better measure than size. That said, it is perhaps right to emphasise the potential of a more local approach as a corrective to the relatively top down delivery that has dominated. It may be possible to combine the benefits of both by encouraging collaboration when bidding for public funds.

Since people will not respond well to a pessimistic or fatalistic message, it is better to sell the benefits of making changes to our housing. Schemes which are good for the environment will and should be good for people. Communicating the potential for better quality of life as a result of improved health, job opportunities, or reduced bills for individuals and the Exchequer, is a message that people and politicians can buy into more readily. Potentially, funding models could factor in multiple outcomes and the savings to the public purse could be mapped more widely as responses to the challenges become more integrated.

Lastly, problem redefinition refers to taking a step back from the perceived "environmental" issues and seeing then as an opportunity for change that is both deep and broad. This is more than a makeover of climate change; it is about working from a coalition in government to collaboration in Whitehall, which in turn translates into action at the level of the neighbourhood. Communities stand to benefit from holistic solutions which seek to turn the necessary actions of retrofit into a programme for local transformation. Local people could be trained up and employed to provide better homes; community engagement can encourage behaviour change at the same time as creating new forums for people to meet and foster social cohesion. If government, charities and business can support such activities the potential benefits are vast.

BACKGROUND

THE IMPORTANCE OF HOME

Home: warm, comforting and safe. These positive images of home might have become the stuff of sentimentality and advertising, but most people probably prefer this image to the alternative: cold, expensive and polluting are unfortunately closer to the truth for many in the UK.

We need to make our domestic dwellings fit for the 21st century. Some big problems are at stake: climate change, fuel poverty and energy security are close relations in achieving this goal. Closer to home, the extended family of issues includes people's health, livelihoods and quality of life. These themes are intertwined and need to be considered together. This report considers what kind of approach can take account of the scale of the challenge and the scales of the solution: from household, to neighbourhood, to national level.

Our research shows the compelling economic, social and environmental reasons why energy efficient homes, coupled with renewable and low carbon energy generation, should be available across the UK, regardless of tenure. The people living in these homes should become increasingly aware of how to get the best out of their home and neighbourhood, sharing in the benefits of the improvements.

25% of the UK's total Greenhouse Gas emissions come from energy use in domestic buildings. Two-thirds of the housing stock that will be standing in 2050 has already been built

SIGNIFICANCE OF EXISTING DOMESTIC DWELLINGS

Home is where the hearth is. Buildings – particularly space heating – play a major role in emissions. Domestic dwellings, the focus of this research, account for 25% of the UK's greenhouse gas emissions – more than the entire GHG emissions of Greece[1]. So there is a huge potential impact of improving efficiency in homes and increasing the generation of renewable energy.

Churchill famously remarked that first we shape our buildings and then they shape us. Given that two thirds of the homes we will inhabit in the UK in 2050 have already been built[2], any comprehensive effort to improve the quality of our housing must take account of the existing stock. This is an area to which more attention deserves to be paid.

Aside from the environmental imperative, there are sound financial reasons for reducing energy consumption in a time of rising costs. Related to this is the demand for energy security: reducing our dependence on dwindling domestic reserves of fossil fuel, or the risk of being held to ransom by volatile international prices and potentially insecure sources. In light of the declining self-sufficiency of energy supply in the UK and the looming disruptions to our gas supply, energy efficiency and microgeneration are essential in addressing these concerns.

Furthermore, there is a strong social justice case for ensuring that poorer and potentially vulnerable members of society are not caught between increasing fuel costs and colder, less healthy living accommodation. Fuel poverty is estimated to affect 1.9m vulnerable households in private accommodation in the UK[3] and a difficult economic outlook may make things worse. Whilst progress has been made through schemes such as the Carbon Emissions Reduction Target (CERT), Decent Homes, and Warm Front, there are concerns that coverage is not consistent, particularly for some types of housing that are harder to treat.

There are therefore strong structural and environmental reasons for improving the energy efficiency of the UK's existing homes and for increasing energy generation. This report assumes that additional energy generation should increasingly come from renewable sources in order to reduce overall emissions and advance the UK's progress towards an 80% cut by 2050, something which cannot be achieved by using fossil fuels.

Facts and figures on household energy consumption, fuel use and carbon emissions are provided at Appendix 1.

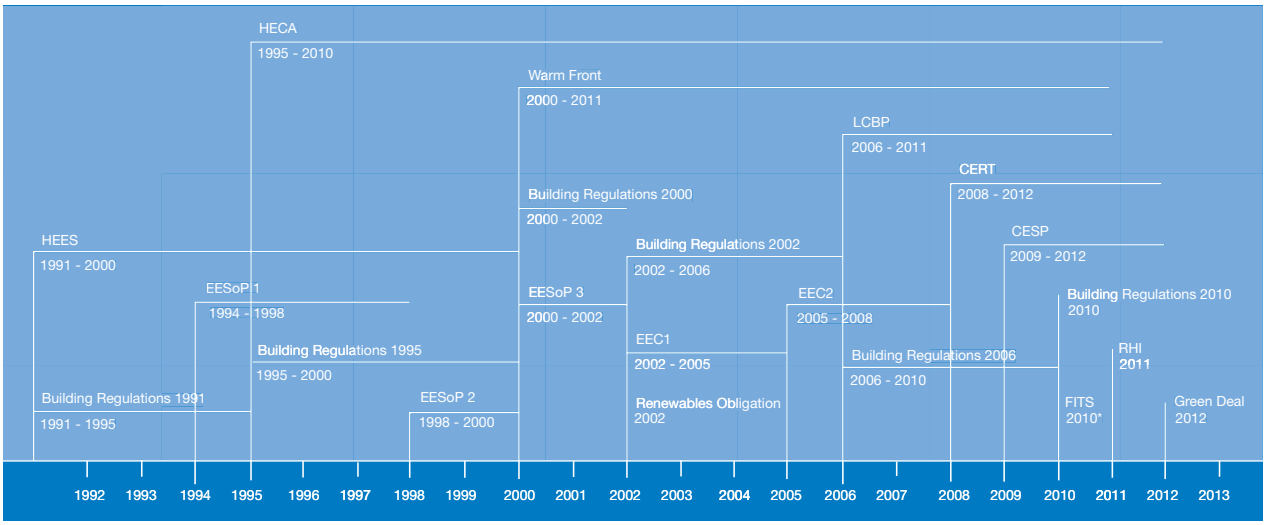
1 UNSTATS, 2009
2 Defra, 2007 and CLG, 2006
3 National Audit Office, 2010

BACKGROUND Continued

POLICY DEVELOPMENT

Various policies have sought to address carbon reduction, energy efficiency, energy generation and fuel poverty. The major ones, present and proposed, are mapped in the diagram below (figure 1). Looking at the diagram, one can see the considerable level of change and turnover in policy terms. It also demonstrates the growth over time of the number of policies seeking to address these issues.

Figure 1: major policies



Key: HEES: Home Energy Efficiency Scheme; EESoP: Energy Efficiency Standards of Performance; HECA: Home Energy Conservation Act; EEC: Energy Efficiency Commitment; CERT: Carbon Emissions Reduction Target; CESP: Community Energy Saving Programme; LCBP: Low Carbon Buildings Programme; FITS: Feed-in-tariffs; RHI: Renewable Heat Incentive (forthcoming); Green Deal (forthcoming).

Historically, energy efficiency and energy generation have been addressed quite separately; it is only with the creation of DECC that these have come together in one department. This lack of integration of efficiency and microgeneration may well be changing with proposed legislation such as the Renewable Heat Incentive in 2011 and the Green Deal, expected in 2012. Until now, legislation has played an important role in directing funding (for instance via CERT), and in creating a marketplace – although it is worth noting that different tenures have tended to be treated quite differently. Given that many significant policies are drawing to a close in 2012 and 2013, now is the time to consider what comes next.

More detail on these traits and summaries of the policies themselves are given in Appendix 2: Policy Overview.

BACKGROUND Continued

ENERGY TRENDS AND DELIVERY PROGRESS

There is a long way to go before energy efficiency and microgeneration reach their potential. There has been progress in making social housing more energy efficient, and basic lower-cost measures (such as loft and cavity wall insulation) are now the norm. But uptake in the privately owned and rented sector is much lower. As for microgeneration, at household or local level it is the exception: less than 1% of houses have on-site renewable energy generation. Furthermore, whilst there are some positive examples of community schemes, for instance using district heating and wind power, less than 3% of the UK's primary energy comes from renewable sources[4]. More detailed information is offered in Appendix 3: Technologies and uptake of measures.

The direction of travel also gives cause for concern, with domestic energy consumption increasing: the period from 1970 to 2007 saw demand grow by 19%[5]. Although energy efficiency measures have saved some energy, people nowadays use much more electricity than before for heating and household appliances[6].

Heating is the biggest use of energy in the UK, dwarfing consumption for all other purposes. This has to be a priority for reduction as the potential for savings is greatest. In descending order, water, and then lighting and appliances, account for the majority of the remaining consumption, so these also need to be part of any comprehensive energy efficiency approach. (Appendix 4: Domestic use of energy, shows the usage since 1970).

Lastly, underpinning this, there is a clear role for behaviour change. If people's habits and expectations have changed in the past, they can change again – though we should not underestimate the complexity of changing behaviour. But technological fixes alone will not be enough to achieve significant savings, not least because improvements will be less effective if people do not modify their behaviour. Smart buildings are likely to require smart people.

The rise in energy consumption also means that any real-term increase in energy generation from renewable sources has been offset by a rising tide of demand, although this trend may have reached its peak. We therefore have a long distance to travel from where we are now to comply with the national policy commitment of cutting carbon emissions by 80% by 2050 (based on 1990 levels).

4 DECC, 2009a
5 BERR, 2008
6 DECC 2009b and Energy Saving Trust, 2006

BACKGROUND Continued

LOOKING AHEAD

On the positive side, we are not starting from scratch. There are policies and resources targeted to improve the energy efficiency of our buildings and their fuel sources. The technologies to resolve these issues exist, and in many cases are not only well-researched but also commercially available. We know what works and how much measures cost – including their payback periods – so implementation at scale is possible and feasible.

However, there is still a long way to go in terms of delivery. We need a national step change beginning now if we are to make proper progress: this report is about how that might be achieved, in particular by considering domestic energy efficiency and renewable energy generation. The future would start to look different: we would move closer to meeting our commitments on climate change; address the injustice of the social costs of inefficient housing falling on those with the least means; and improve our energy security. With the coalition government promising change, and a number of key policies drawing to a close, the time is right to improve policy and delivery, rising to the challenges we face and reaping the benefits of a greener economy, warmer homes for all and a more stable country.

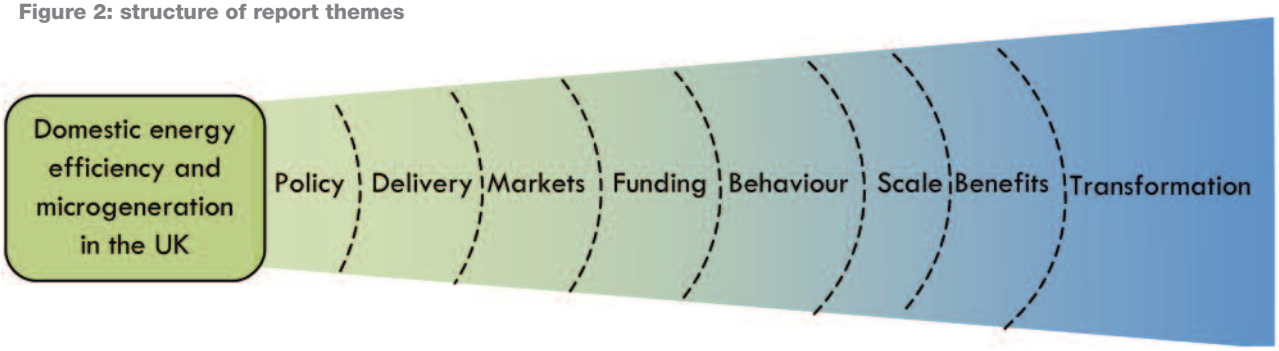
At the same time, this report is written with austerity in mind. The authors and interviewees alike are mindful of the many services which require state funding and the pressure to reduce costs. In addition, policy has played a key role in creating a market for energy efficiency and, increasingly, microgeneration. The recent coalition budget stated that the UK requires a total of £200bn investment up to 2020 to "provide secure low carbon energy". The Wigley report on the Green Investment Bank said that £550bn of investment would mean that the UK could meet its targets for climate change and renewable energy over the same period. As the budget itself suggests, market reform and private sector investment will be required to ensure continued progress in the face of public sector financial constraints. This report seeks to bear in mind the practicalities of funding activity and recognises that a mixture of funding – from the state, businesses and able-to-pay individuals – will be required to make the progress that we all need.

THEMATIC DISCUSSION

A number of themes pertaining to energy use and generation in UK homes and to their occupants emerged in the course of the research and are discussed below. These were identified through desk based research, stakeholder mapping, the development of case studies, and interviews from across government, business, academia and the third sector. This section seeks to take account of strengths and weaknesses as well as identifying areas of consensus. The recommendations, shown in grey boxes, are integrated with the analysis.

The report moves from a focused discussion of energy efficiency and microgeneration for the domestic sector to a broader consideration of delivery challenges as well as the potential benefits of implementing changes. This can be thought of as a broadening of perspective during the course of the report.

Figure 2: structure of report themes



The movement can be summarised thus:

- Improving the links from policy to delivery
- The development of a robust market in energy efficiency and microgeneration
- Funding options and how we might pay for the necessary improvements
- The role of people and their behaviour in changing our energy habits
- Seeking the right scale – or mix of scales – for effective solutions
- Broader benefits of energy efficiency and microgeneration, including health and jobs
- Redefining the problem in the light of the solution – how energy efficiency and microgeneration can serve as a lever for transforming communities

Each bullet represents one theme in the next section and is accompanied by corresponding recommendations.

POLICY COHERENCE SUPPORTS DELIVERY

Winter fuel payments of £2bn per annum are spent on heating costs – but could be diverted to efficiency or generation if homes were made warm

A discussion about housing and the integration of energy efficiency and renewable generation needs to take account of the house as a whole. All the people we spoke to (see Acknowledgements) recognised the need for a "whole house approach" – an approach which integrates multiple energy efficiency measures and microgeneration.

Why take a "whole house approach"? A number of reasons came up again and again, with varying degrees of emphasis. Perhaps the main reason was that it allows for cross-subsidising across a basket of measures. Under a piecemeal approach, people tend to make low-cost changes and ignore the ones with longer payback periods. But a whole package, where some measures are lower-cost and others dearer (including some which would be income-generating under Feed In Tariffs (FITs) or perhaps the forthcoming Renewable Heat Incentive), makes most sense when applied in a co-ordinated fashion in the right way for a particular property. Effectively, the cheaper or more profitable changes help pay for the more expensive ones.

Another reason for the whole house approach is that it makes life easier for at least three groups of people: the resident (as disruption is concentrated into a shorter space of time, and they are more aware of changes to the property that require them to behave differently too); the contractor (who saves on installation costs including scaffold, for instance); and, potentially, the financier (who has to make one deal for a whole package rather than a number of smaller loans). For these reasons, the whole house approach is a necessary part of a move away from a focus on low-cost measures to the comprehensive retrofit needed to generate changes on the scale and at the speed that policies and the climate require.

Hope for a whole house approach

Despite this logic, the unanswered question is why the whole house approach has not emerged as a standard product. Policy coherence (or a lack of it) seems to be a significant reason, since past policies have been fairly narrow in scope.

Encouragingly, the Community Saving Energy Programme (CESP) and the Pay As You Save (PAYS) pilots show a more holistic approach. It may be possible to improve these policies further, through the anticipated Green Deal, to underpin a whole house approach. For example, under FITs, an energy-inefficient home is eligible for solar panels: this generates green energy, but ignores the need to improve efficiency or change behaviour, and thereby reduce consumption. To rectify this, as an incentive to bring dwellings up to minimum energy efficiency standard, FITs could put an obligation on applicants to do basic energy efficiency measures first. A similar model has been created by Kirklees Council: under their RE-Charge Scheme, properties can only get funding if they have already undergone basic energy efficiency measures. The RE-Charge Scheme works differently from FITs, but it shows how grants can encourage green energy generation and efficiency at the same time.

In fact, Government considered requiring properties to be up to a certain energy efficiency standard when consulting on FITs last year. In the end, it decided against this, arguing that it would further complicate the eligibility criteria for the scheme and would be difficult to monitor and enforce. Another scheme, the future Renewable Heat Incentive (RHI), may require a basic minimum level of energy efficiency for existing homes. It has been proposed that the level would be at least 125mm of loft insulation and cavity wall filled where appropriate[1]. At the time of writing, the details have not been confirmed.

1 DECC, 2010f

Joining up funding and policy

Some interviewees stressed how hard it is to combine funding streams governed by different policies. Combined funding can be crucial for projects, particularly ones that go beyond prescribed measures. While one could argue that it is up to deliverers to make the connections, there do appear to be examples of added value being missed. The coalition of political parties may need to be matched by a coalition of Whitehall departments.

Simplification of policy and integration of funding are another big improvement to make. Nearly all our interviewees were in favour of this idea, and it has also been suggested by the House of Commons Environment, Food and Rural Affairs Committee. Money from energy companies to meet the carbon emissions reductions target (CERT) could then be pooled with funds from other programmes[2]. The time to do this could be very soon. There is a natural break point, illustrated by the policy diagram above, where much legislation draws to a conclusion in 2012 or 2013. The timings could be aligned so that a comprehensive piece of legislation could be enacted and any appropriate commissioning could follow. This seems to be part of the intention of the Green Deal proposed in the 2010 Budget. The Renewable Heat Incentive, an initiative of the last government but continued under DECC, could be picked up at this point as well.

Winter Fuel Payments

A further example of the gap between policy and delivery is Winter Fuel Payments, which currently cost over £2 billion per year and have been increasing over time. This universal allocation is intended to help people over 60 keep warm in winter by acting as a contribution to fuel bills. Changing Winter Fuel Payments is politically sensitive, but the payments are not means tested and could be spent better.

It has been suggested that only 12% of Winter Fuel Payments reach the fuel poor, and a lesser proportion of this may actually be spent on fuel bills[3]. Anecdotally, the better-off will use it on something unrelated ("presents for the grandchildren" was one remark from our interviews) whilst the harder-up are more likely to spend it on food than heating. Similar sentiments came out of Durham's focus groups, conducted as part of its work on Total Place (see below).

One option for making sure Winter Fuel Payments reach those most in need would be to make them taxable and/or means tested. By one estimate, this would provide around £250 million per year that could be diverted to energy efficiency programmes[4]. However, aside from the administration costs, this would not ensure that the money goes towards making people's homes warmer.

A better use for Winter Fuel Payments would be to make physical improvements to a good standard, rather than acting as a permanent and potentially unsustainable benefit. Using this money for energy efficiency and microgeneration would still benefit the intended group, at the same time as reducing costs to the state in the medium term and boosting both the public finances and the demand for improvements, which in turn supports employment.

Whilst it is reasonable to point out that rising fuel prices could still make it harder for people to heat their homes, energy efficiency measures will mitigate the effects of this and renewables are more reliable in terms of their generation costs. Creating more self-reliance at household and/or community level is the best long-term way to protect people against volatile fossil fuel prices. Although the current government has expressed its commitment to protecting Winter Fuel Payments in the coalition agreement, there is no long term guarantee that changes will not be made. The Winter Fuel Payment could be replaced by a better scheme.

2 House of Commons Environment, Food and Rural Affairs Committee, 2009
3 ibid
4 ibid

RECOMMENDATION - NOW

Set basic energy efficiency requirements for FITs and RHI: FITs and the RHI offer opportunities for a more integrated approach that begins with improving energy efficiency, reducing consumption and then improving generation. The requirements could be tightened over time and/or incentivised, so that more energy efficient homes benefit from a more favourable tariff rate.

RECOMMENDATION - NOW

Divert the funding from Winter Fuel Payments to improving properties: Means test Winter Fuel Payments with immediate effect. Improve the physical condition of the homes of those in need as rapidly as possible using this funding. This should be combined with checks on vulnerability and benefit maximisation. As the property is improved, the Winter Fuel Payments should be phased out. In welfare to work, David Freud has advocated paying DWP contractors using Annually Managed Expenditure, which includes benefits, rather than just the Departmental Expenditure Limits. A similar principle could be adopted with regards to Winter Fuel Payments – spending on physical changes to reduce ongoing costs.

MAKING MARKETS WORK

There is a lack of a trusted source offering property-specific efficiency and microgeneration advice

All markets are imperfect, but some are more imperfect than others. In the market for energy-reducing and energy-generating products and services, both suppliers and consumers face related but different problems. There are also different types of consumers: social housing, private landlords and able-to-pay homeowners. What they all have in common is the need for more sophisticated and higher-cost measures – but these are not being supplied at the rate required.

BOOSTING DEMAND

To put it simply: without demand there will be no supply. At present, interest is low, and where there is interest, there are barriers to action. As one of our interviewees explained, we are collectively trying to sell something which people do not want. There is a need to generate more demand for energy efficiency products and services more quickly.

Most interviewees agreed that regulating the existing housing stock is vital to producing this demand. While some homes are already up to a moderate energy efficiency standard (particularly in the social rented sector), the incentives in place are not getting products and services to all homes quickly enough nor are they encouraging people to go further and install more effective – but generally more costly – measures.

To help the market along, Government should regulate existing buildings by making basic energy efficiency measures mandatory when buying, selling or renting out a dwelling or doing consequential works to the building. The Home Truths report commissioned by Friends of the Earth and the Co-operative Bank recommends a standard which applies at the point of sale or rental of a property, and gets tougher over time. In this model, the regulation applies on re-sale or re-letting: a property can be bought whatever its rating, but it cannot be re-sold later without meeting the minimum standard[1]. Passing the requirement onto landlords will also benefit private renters, who otherwise have very limited influence over the fabric of the building where they live and, as a consequence, currently live in the worst insulated housing (see Appendix 3). The standard could be voluntary at first (as in the Minergie standard in Switzerland) and then be made obligatory later. This clear direction of travel would act as a clear market signal which would be picked up by investors, purchasers and estate agents alike.

RECOMMENDATION - NOW

Develop a voluntary energy efficiency standard for refurbishment: Government should develop a voluntary standard immediately. This is relatively inexpensive to achieve but would indicate the direction of travel. This standard could guarantee privileged access to funding streams such as Green Deal, FITS, RHI etc., which in turn would be likely to increase uptake.

In terms of renewable energy generation, Feed-In Tariffs are a step in the right direction as they provide a clear and long-term price signal to potential customers and investors. By stimulating the market, the FITs scheme is encouraging the uptake of microgeneration technologies in the UK. However, FITs could be much more ambitious. The proposed scheme will see just 2% of UK electricity generated from microgeneration by 2020[2]. This is a humble figure compared to the potential of generating half of the UK's energy from renewable or low carbon sources. Increasing payments from FITs might help, but this is unlikely to be feasible, given that the scheme is quite new and affordability would be a concern.

1 Boardman, 2007
2 DECC, 2010a

In new build, the Code for Sustainable Homes combines energy efficiency and generation, increasing the mandatory standards over time. Crucially, the Code works across tenures (though with different rates of adoption). We recommend developing a similar mechanism which would apply to housing refurbishment. This new Code would combine energy efficiency and generation, with an incentive which goes further than FITs for generation: it would help to move the market beyond low-cost measures. In practice, this would also support a "whole house" approach.

RECOMMENDATION - LATER

Introduce a Code for Sustainable Refurbishment: The Code for Sustainable Refurbishment should be made obligatory for all tenures, including making it incumbent on landlords in the private rental market, and tightened over time. This should be in line with the carbon reduction targets. It is a measure which should be developed now and introduced shortly.

CONSUMER CONFIDENCE AND SUPPLIER CREDIBILITY

One area which came up several times in our interviews was the twin issues of knowledge and trust. Energy efficiency and microgeneration are relatively complicated decisions and people do not have experience of making choices about them: it needs to be made easier for them to make good judgements. Consumers also want independent and impartial advice. Government-funded bodies provide general advice, but when it comes to property specifics ("what should I do with my house or flat?") there is no independent, authoritative source. Several interviewees saw their organisation's independence as a market advantage, referring to their distance from energy suppliers – but the lack of a perceived reliable source of specific information and advice for consumers is still an important barrier to development of the market. In the worst cases, mis-selling will take place, and anecdotally people have already taken out loans to fund infrastructure improvements which will not last as long as the term of the loan.

To respond to these concerns, the Domestic Energy Efficiency Advice Code of Practice has been developed. However, the Code of Practice is a self-regulated programme and there is no third party validation of organisations that have signed up. It is a self-certification scheme where advice providers sign a declaration to confirm that they comply with the standards it sets out.

Another way to build trust in the market is through the certification of installers and advisors. This is more advanced in the renewable generation sector: the Microgeneration Certification Scheme (MCS), funded by the industry, acts as a portal to different types of products and a form of quality control for consumers. However, whilst this is helpful, it may not be enough. One interviewee mentioned what he perceived as a rush towards Combined Heat & Power, questioning whether it delivered the anticipated reductions in bills and if the skills needed for maintenance were widely distributed enough. Generating technologies, particularly at community or neighbourhood scale, have been developed but are not seen as fully tried and tested. Even though there is plenty of good experience of microgeneration technologies from other countries, and research on the benefits exists, this does not automatically convert to market adoption because the confidence is lacking – arguably, a sign of market immaturity.

As for energy efficiency, although trade bodies exist, there is no national certification scheme along the lines of the Microgeneration Certification Scheme in the UK. There is a somewhat fragmented picture, with different certifications such as the various City & Guilds energy efficiency qualifications[3] and certificates of training courses in Building Regulations Part L Energy Efficiency. Whilst a certification scheme alone cannot tackle the challenge of consumer confidence, it would strengthen people's trust in suppliers. It would also reduce the number of cases where installations are not done properly.

3. These include the Certificate in Energy Efficiency for Domestic Heating, NVQ in Providing Energy Efficiency Services, Energy Awareness, Certificate in Thermal Insulation, NVQ in Insulation and Building Treatments, and the NVQ in Thermal Insulation.

In order to make the most of a certification scheme, it needs to be embedded in the key policies. Certified installers could, for example, get privileged access to funding streams; and over time, certification could become a requirement. This could also become a national standard which lenders could lend against with confidence.

RECOMMENDATION - NOW

Energy Efficiency Supplier Certification Scheme: in the context of the Green Deal, Government should support industry to set up a certification scheme for energy efficiency similar to the MCS. There is now increasing appetite for such a scheme in the industry, so key players including Eaga should collaborate, taking the initiative to bring this about. Certified installers should be granted privileged access to energy efficiency funding streams making it a requirement over time. This can help raising customer confidence and contribute to the uptake of energy efficiency measures.

WHO PAYS?

How do we pay for the changes needed to accomplish a proliferation of energy efficiency and microgeneration in the UK? Our research uncovered a widespread sense that the full range of options has not been considered. In a climate of public spending cuts, this discussion is highly relevant. This section looks at some of the options.

A GREEN INVESTMENT BANK

A Green Investment Bank has been proposed from a number of political quarters as well as the private sector. How this might work has not been finalised, but the general principle is that of an independent institution which uses funding, at least in part from the state, to focus on investment in green solutions. This lowers the cost of capital compared to going straight to the market.

There are some examples of this in other countries: for example, the German KfW Bank provides loans for low carbon refurbishment and new build, though a different model might be more suitable for the UK. In the 2010 Budget, Government announced that it will put forward detailed proposals on the creation of a Green Investment Bank after the Spending Review. The Green Investment Bank Commission recently put forward proposals for such a bank to finance home energy efficiency and low carbon district heating schemes[1].

RECOMMENDATION - NOW

Given Government's commitment to **establish a green infrastructure bank**, these proposals should be advanced to stimulate and underwrite green mortgages and investment in low carbon housing until the market has matured to a level where this is no longer necessary. Ideally there should be a rapid establishment of such an organization with adequate funds, as suggested in the Green Investment Bank Report.

1 Green Investment Bank Commission, 2010

ALTERNATIVE FINANCE OPTIONS

Besides a green investment bank, there are a number of other options for financing the necessary changes.

Social finance

Use of social finance is a significant possibility. This idea was not prominent in the literature we reviewed, but it was mentioned by several practitioners. For example, the charity Tomorrow's People has used bonds offered to the public as an alternative means of funding. The bonds are essentially used as an interest-free loan to achieve social objectives for a fixed duration such as five years. The money is returned at the end of this time and the foregone interest acts as programme funding. This is of interest as a philanthropic mechanism, especially when funding is under threat owing to the economic climate, but it is not commercial (in the sense that it will presumably motivate investors interested in a purely social return, rather than a financial one). By contrast, the Ministry of Justice is testing a Social Impact Bond developed by Fair Finance on a contract with St Giles Trust. With this bond, the private sector invests in socially desirable outcomes, creating the cash flow for intervention, and the government pays the investor based on successful performance by the delivery agent.

Similar mechanisms could be applied to domestic generation and energy efficiency. More innovative still would be a community environmental bond which combined able-to-pay members and public funding into a social investment vehicle, the purpose of which was to reduce carbon emissions and/or fuel poverty. Government can help encourage these ideas; at the same time, there is also potential if people are prepared to invest in developing such mechanisms.

Franchises

A further proposal is to create 'Low Carbon Investment' franchises. The discussion paper "A new energy infrastructure"[2] envisions a competitive franchise model which could deal with the fitting or construction of energy efficiency and renewable sources of heat and power, as well as network renewal and the operation of shared resources such as district heating. These would be owned along co-operative lines.

This would address many of the current challenges by:

- Making low carbon infrastructure the output, not just a regulatory obligation, for the franchise businesses. This should encourage a better balance between energy efficiency, renewable electricity and Combined Heat and Power (CHP);
- Transferring some, if not all, of the upfront investment cost from the customer to the franchise, and/or create models which support the customer through this process. The franchise could also act to manage multiple funding streams;
- Co-ordinating the roll-out of investment in technologies that need geographic proximity to get effective economies of scale. These technologies include external insulation, district heating/CHP, and community renewables;
- Because of the competition that franchising would introduce, it might be possible to do away with the complex price-setting and incentive structure that network regulation currently uses; and
- Bringing together supply and demand, so that customers pay for the service of a comfortable home – warm water, heating, means to cook and electricity – and the franchise is encouraged to provide it efficiently.

A move towards franchises would make setting up Energy Supply Companies (ESCOs) increasingly practicable and possible. Combining this with a national franchise model would also create a new possibility for government commissioning.

2 Vaze, P. and Mayo, E., 2009

RECOMMENDATION – MEDIUM TERM

Government to review the potential of a Social Impact Bond and a franchise model in commissioning, with a view to implementing them in 2011 or 2012. The former could specify outcomes to reduce carbon emissions and/or fuel poverty, and the state would pay on results. This could be combined with, or kept separate from, a franchise model which presents an interesting and apparently viable option for area-based approaches.

TAX

The tax system currently does not work either elegantly or consistently. For instance, the consumption of energy is currently taxed at a lower rate – via VAT at 5% – than that applied to the refurbishment of properties. There is a need for wider exploration of fiscal options to offer both carrots and, increasingly, sticks to accomplish change.

One suggestion that came up in the course of the interviews was tax rebates: could people be given a tax allowance if it was spent on approved products which reduced carbon emissions? Variations (summarised in the boxes on the next page) on this theme are underway in both France and the United States, and although it is too early to identify the effects, these schemes may well offer useful lessons. A personal tax allowance could act as a considerable incentive to the able-to-pay market.

A number of other options, including linking home improvements to Capital Gains Tax, Council Tax, reduced VAT, and Stamp Duty were outlined in the UK BCSE paper "Delivering carbon savings in the domestic sector"[3]. The "Building a Greener Britain" report[4] similarly suggested a Council Tax rebate. Whilst there are pros and cons to all of these, Council Tax as a mechanism offers an ongoing incentive rather than a once-off saving: this might be fairer, particularly for people who make improvements and then stay put in their home. A Council Tax rebate would also offer a longer-term price signal which one would expect to see reflected in house values.

On the other hand, a revaluation of properties would be sensitive and quite resource-intensive if it were done thoroughly. Alternatives might be to make changes when the property changes hands, or to create a system whereby people could apply for a deduction once certain improvements have been made: these could then be certified, for instance on the basis of the Energy Performance Certificate (EPC). Such changes could even be made revenue-neutral by increasing Council Tax for the worst properties over time, and reducing it for efficient ones at change of occupation.

3 UK BCSE, 2010
4 Killip, G, 2008

Example from France - Crédit d'Impôt Développement Durable

The "Crédit d'impôt développement durable" (sustainable development tax credit) is a tax deduction scheme dedicated to sustainable development. Tax deductions of 25-50% are available for equipment enabling energy saving and low-carbon energy generation for private or community dwellings. Measures supported under the scheme are insulation, heating system upgrades, and the installation of renewables. Installation costs are not included in the eligible cost except for installation of insulating material (windows excluded). A maximum deduction of 8000€ for a single person, 16000€ for a married couple, and a supplement of 400€ per dependent person is available. This measure is complemented by a reduced level of VAT to 5.5% on material and installation cost.

Example from the US - Federal Tax Credits for Consumer Energy Efficiency

In the USA, homeowners can apply for tax credits for energy-efficient products or renewable energy system including insulation, biomass stoves, wind, solar, and geothermal heat pumps. Those measures are eligible for tax credits at 30% of the cost, up to a total credit of $1,500. The maximum does not apply to geothermal heat pumps, solar energy systems, wind energy systems, and fuel cells, which have no upper limit.

RECOMMENDATION - LATER

Develop progressive fiscal incentives: Particularly for high-cost measures, more financial incentives are needed, which at some point will need to take account of taxation. This will help to stimulate the market, bring down costs and build the supply chain. Incentives building on existing mechanisms might include reduced VAT rates, lower Stamp Duty for low carbon homes, and reduced Council Tax, with Local Authorities allowed to change Council Tax bands based on energy performance of buildings.

EQUITY

Both for reasons of fairness and efficiency, it is essential that all parts of society be included in the drive to introduce energy efficiency and microgeneration. The fact that even some lower-cost improvements have not been made is probably as much about affordability as education.

Because of the upfront capital costs of microgeneration technologies, Feed In Tariffs are most appealing to homeowners who can afford to invest. Those who rent, or cannot afford paying upfront and are unable to secure a loan, are left out. There are some promising developments in social housing: one example is Eaga's scheme to install PV at no cost to registered landlords using investment from the City repaid by FITs, whilst the energy generated is provided to the resident at no cost, lowering their bills.

But the scales are still weighted against the less well-off: the fact remains that many people cannot afford to make improvements themselves. Preferential loans and some subsidies are likely to be necessary over time. The current return on investment under FITs is just 5-8%[5]; assuming a 6% interest rate (a figure that has been mentioned) on a loan, the profit margin more or less disappears.

Two of the most successful countries with regard to renewable energy are Germany and Spain. A crucial similarity between both countries is that their equivalents of the feed-in tariffs are supplemented by a broad portfolio of additional support measures: tax deductions on investments in microgeneration, soft loans with stable financing conditions, and investment incentives (subsidies and partial debt relief) for some selected technologies[6]. These need to be made available to everyone in the UK, not just those perceived as most credit-worthy by commercial lenders – although in some cases this may be done indirectly, for instance via social housing organisations.

A further factor to think about is the financing of change. Ultimately the costs of schemes like FITs and CERT are borne by households through their energy bills. At present, poorer people are the least likely to benefit from FITs, but they still have to pay for them.

The same issues of equity apply to energy efficiency. The Wigley report suggests a sliding scale of loans, varying from 100% upfront loans for those able to pay, through to 100% subsidy for those without the means to afford energy efficiency improvements. In fact, something close to this has already happened in social rented housing, where tenants have not had to pay for improvements such as Decent Homes. But challenges remain for those on low or middle incomes who will need access to capital at preferential rates. They will need this more as the easier and cheaper improvements are completed: further improvements will need more money to be spent upfront and will in some cases take longer to pay for themselves. The statement in the 2010 Budget regarding a "Green Deal", which heralds a pay as you save model – with savings from energy bills paying for home energy efficiency measures – is a positive one. There is also a reference to low income households; but it looks like market solutions, such as green financial products supported by the Green Investment Bank, are the government's preferred option.

One of the clearest examples of a need for equity is fuel poverty, where households need to spend more than 10% of their income to keep warm. The proposal to means test Winter Fuel Payments or make them taxable (see page18) is a way of supporting equity by making sure that the benefit applies to those that need it most. However, as that section also pointed out, greater energy efficiency and microgeneration will help remove some of the uncertainty around fuel prices, so channelling resources to pay for improvements rather than fuel makes good sense. Having a highly energy efficient home with some energy generation from renewable sources is a permanent way of protecting against swings in fuel prices, whereas providing fuel payments is only a temporary sticking-plaster. Financial resources are much better spent on long term efficiency.

5 DECC, 2010a
6 Ragwitz and Huber, 2005

Lastly, we should not overlook the fact that low household income is a significant contributing factor to fuel poverty. Improving housing is undoubtedly necessary, but unless poverty itself is addressed, many homes will stay cold, to the detriment of people's comfort and health. One way to help is to ensure that people are making the most of their entitlements. The complexity of the benefits system, and the difficulty some groups have with navigating it, mean that people often fail to get access to the help which the state has already put in place. Turning this around will help reduce fuel poverty as well as increasing people's general quality of life.

RECOMMENDATION – MEDIUM TERM

Use the Green Bank to provide low cost loans for microgeneration and higher cost energy efficiency measures: like the energy efficiency funding model in the Green Investment Commission Report, the Green Investment Bank should offer finance packages to householders for microgeneration. By providing support and potentially subsidies to the less able to pay, FITs could be made widely accessible. The Wigley report also acknowledges the need for finance as an important factor in supporting community renewable energy projects which can benefit multiple homes.

Combine benefit maximisation advice with fuel poverty initiatives. . In some cases this could happen quickly as an added value element to existing schemes. Over time, it is suggested that advice on benefits should go beyond signposting, to helping people understand their eligibility and even liaising with agencies on their behalf. This could be part of future commissioning.

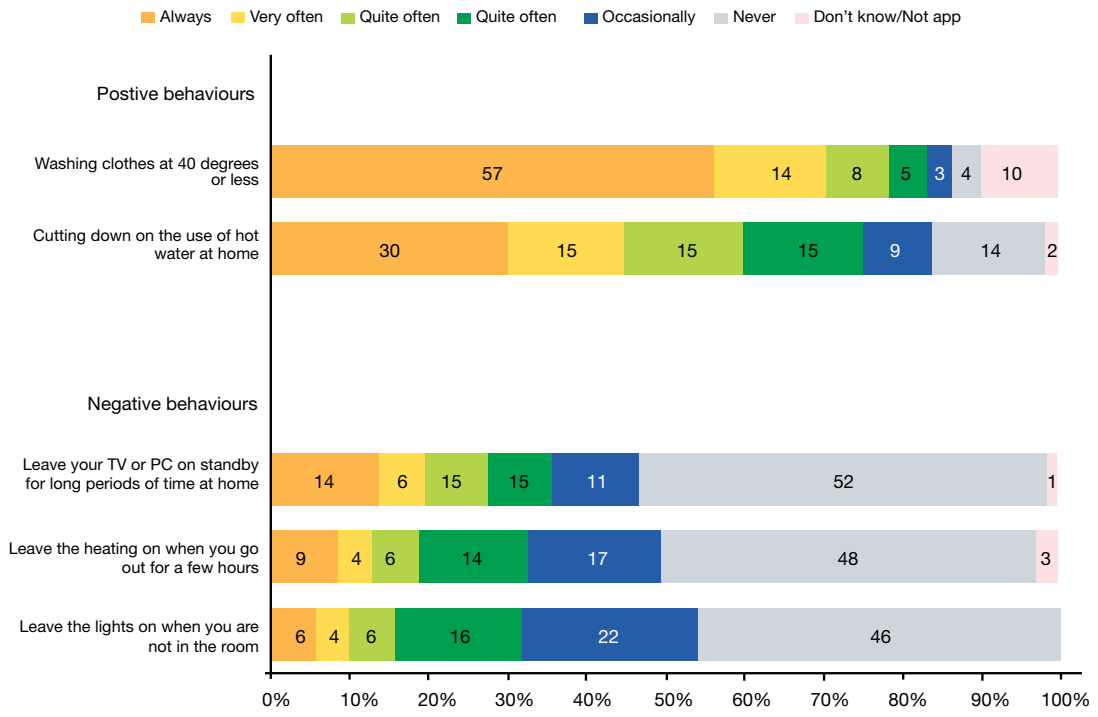
ADDRESSING PEOPLE'S BEHAVIOUR

> Buildings don't use energy: people do

All physical improvements could be in vain if people's behaviour does not change. As Katy Janda from the Environmental Change Institute put it: "Buildings don't use energy: people do"[1] . For example, an older person short of money may not heat a well-insulated house, so it could still be cold. Another person might open windows while the heating is on to get some fresh air. Behaviour and behaviour change are regularly identified as an area in need of further work; and, although they are large subjects, they have arguably been neglected. But improvements to a building (in terms of efficiency or renewable generation) need to be accompanied by changes in people's behaviour, if they are to achieve their potential.

Defra is the agency which monitors and measures attitudes and behaviours towards the environment in England. The data from its surveys can be used to indicate people's attitudes and behaviours towards energy efficiency. The next figure, taken from Defra survey results, shows how often people say they engage in energy-saving (and non-energy saving) behaviour.

Figure 4: Cutting down on energy use – frequency of behaviour



Base: All respondents (2,009)

* Unclassified includes those who answered 'don't know' or said the behaviour was 'not applicable'

Source: Defra, 2009

1 Janda, 2009

There is a significant increase in the number of people who said they cut down on gas and electricity at home from 58% in the 2007 Defra survey, to 76% in 2009. Fewer people said they turned down their thermostat, or cut down on using hot water, though this was still claimed by a majority (66% in 2007 and 64% in 2009). Overall, the figures give some encouragement that people are becoming more aware of both positive and negative practices and may be taking action. (On a note of caution, the numbers are based on interviews rather than observed behaviour: there may be a discrepancy between what people say and what they do).

To get the best results, first of all buildings should be designed to require less energy and then people should be encouraged to use them in the most efficient manner: for example, when wind or solar technologies are installed, a family would learn how to get more from their home (for example, by turning their appliances on when energy generation is at a higher level). Unfortunately, however, physical and behavioural mechanisms show little integration at present – even though a few simple interventions could make a massive difference. For example, the heating controls specified in the current building regulations[2] could contribute to a 17% reduction of average domestic energy demand if rolled out across the UK[3]. There is the potential for a positive reciprocal relationship between increased awareness and technologies which make it easier for people to save energy.

How can the current situation be improved? DECC, with Ofgem, is responsible for the roll-out of smart meters and is the sponsoring department for the Low Carbon Communities Challenge. It is managing a research project on energy demand, conducted by four of the large energy suppliers, to trial smart meters and other energy-saving approaches, including education and engagement. Future commissioning could be influenced by the results of this research (depending on the results, which are expected towards the end of 2010). As the Better Outcomes report[4] points out, using the commissioning process to incentivise outcomes is already quite well tested in a range of public services, including welfare to work and health. Amongst other areas, the report also recommends it for waste management and recycling. Could it also be used to help householders reduce their energy consumption?

Some interviewees felt that there were lessons to be learnt from the commercial sector here: treating people as customers and understanding their needs and corresponding buying behaviours may have more success than a blanket approach – at least, as long as people are incentivised more than they are penalised for making changes. One of our interviewees remarked that the energy suppliers had made a virtue of the need for energy efficiency by using it to improve their reputations, and to cross-sell and up-sell, encouraging the customer to buy more – a new boiler, say – as a result of the interaction. One line of exploration (with particular relevance to the able-to-pay market) is that of trigger points: when are people most likely to want to make changes to their property? Moving in, moving out, reconfiguring and changes to family status are some examples of opportunities for intervention.

Our interviewees also tended to be slightly sceptical about mass market campaigns: some observed that national programmes had not achieved the kind of brand recognition that would make them "household names". The ineffectiveness of some mass campaigns, along with the fact that people have different needs and desires, adds up to a need not so much for information, as targeted intervention.

This targeted intervention could be made by demographic group, but equally by geography. The interviews revealed considerable interest in social norming (that is, suggesting to someone that others around them are behaving in a certain way, to encourage them to do it as well). People are influenced in their behaviour by friends and neighbours. Collaboration in and across areas is possible, and shifts both the challenges and solutions to a larger forum which can help mobilise for change. Such discussions are interesting in the light of the emerging debate around the Big Society and community organising: could the community organisers of the future be trained in green energy issues, so that they are equipped to mobilise around this if the demand arises? More generally, central government will continue to play a role in behaviour change, but there was also a call to "back what works" and offer support where businesses or charities are already making progress.

2 Electronic programmer, room thermostat and thermostatic radiator valves
3 Enviros, 2009
4 Lauren M. Cumming, Alastair Dick, Lord Geoffrey Filkin, Gary L. Sturgess, 2009

RECOMMENDATION – MEDIUM TERM

Review the place of behaviour change in outcomes-based commissioning, ensuring that all relevant parts of government, including DECC and Defra, feed into this. Rather than specifying services or activities, outcomes-based commissioning puts the emphasis on identifying the intended outcome of a contract, and procuring for this. Full payment is made subject to achievement of the agreed outcomes. Bidders could be encouraged to develop models which cut across supply and demand, so the physical improvement of installing a new technology is also the cue for education about the financial and energy savings that are possible as a result of changed behaviour. For instance, if one of the primary purposes of installing smart meters is to reduce energy usage, then part of the contract payment could be reserved for, say, one year and be subject to a certain average percentage reduction in consumption. The mechanisms used to achieve this would be at the discretion of contractors, but, for instance, they could choose to offer rewards to participants who make significant savings.

A QUESTION OF SCALE?

> We must learn to think in terms of an articulated structure that can cope with the multiplicity of small-scale units

E F Schumacher

At what scale should the changes discussed here happen? Would they be most effective at national, regional or local level? The question of the right scale is one of the most alluring, and at the same time one of the most confusing.

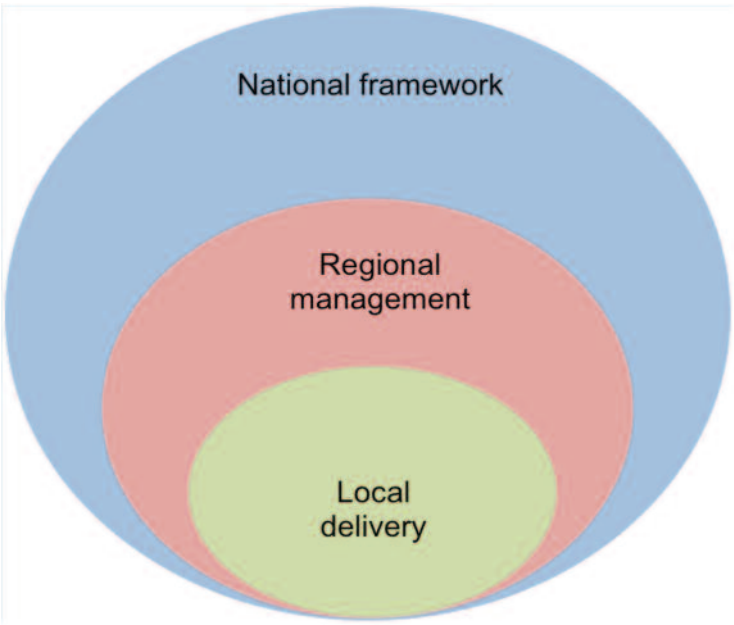
One of the hypotheses tested by this research was the idea that a focus on community or neighbourhood level would be beneficial to improving energy efficiency and energy generation for housing. This is only partially the case: there is no one right answer to the question of scale. Instead, there are benefits to be found at different scales. The views of participants were mixed on the issue of whether scale could or should be prescribed. Generally, our interviewees welcome or at least accept the diversity of different approaches from small communities and larger ones. In some cases, they questioned whether solutions can be transplanted successfully from one place to another.

In terms of commissioning public schemes, larger schemes can produce efficiencies of scale – but they can conflict with the drive to do things locally. One suggestion worth discussing is whether public policy would do better to start at individual level, and allow the emergence of structures at any scale above this – much as Schumacher suggested.

Local, regional and national

An approach many of the interviewees suggested or endorsed is that of local delivery, regional management and a national framework. This is represented in the following diagram:

Figure 5: possible scales for intervention



- The need for local delivery recognises that local context varies greatly. The variables include how affluent people are and their ability to pay; population demographics; building stock; the urban-rural continuum; and variations in social capital from area to area. Different actors with different capacity and capability seek to marshal different funding streams. Because of this complexity, it is likely that there will always be a need to adapt larger programmes to the local context.
- Regional management should ideally allow economies of scale and avoid duplication. Regional actors can be a bridge between central government and local delivery. In some cases, they can navigate the multiple programmes which currently exist but which could be simplified. Area contracts would be one way to do this.
- The national framework is essential to creating confidence, providing legal consistency, and allocating funding. Some ways in which this framework could be strengthened are suggested above in the section Policy coherence supports delivery.

In a somewhat similar fashion, the report "A new energy infrastructure" refers to ecologies of scale, meaning combinations of activities at different levels. This drive for a layered approach is generally accepted, although determining what sits best where calls for further research – again, there is likely to be more than one right answer.

Localism and the Big Society

The idea of a more local focus is a hot topic right now: there are a number of reasons for this, not least of which is the rhetoric around localism. The Big Society is still being defined, but it has struck up the themes of a local focus and giving people and communities more independence to shape their spaces and services. As one interviewee remarked, "local" is arguably "the one that's not been tried". Whilst schemes such as Warm Front have included some collaboration with local authorities around referrals to ensure higher uptake, these are nonetheless large contracts which are procured by central government. Local authorities have established Local Strategic Partnerships and Local Area Agreements (LAAs), the majority of which include a commitment to cutting carbon emissions, although the abolition of LAAs was announced in October 2010 by the government. Finally, other approaches such as Total Place are being trialled in specific areas, although only one of the Total Place Pilots, at Durham, is seeking to address domestic energy efficiency. Despite these examples, the local approach has only been applied in a relatively piecemeal fashion and to a limited extent so far.

The neighbourhood scale seems particularly relevant to behaviour change and community generation projects. This is covered in more detail in the section Addressing people's behaviour . However, several interviewees suggested that a neighbourhood focus – ideally, an inclusive one – could help to change local attitudes and establish new social norms related to saving energy. There are also a number of examples of successful community microgeneration schemes and even overarching campaigns which worked at a level between that of a street and a town. One example, Low Carbon West Oxford, is shown in the box below.

Low Carbon West Oxford

Low Carbon West Oxford (LCWO) was set up after the summer floods of 2007 by residents concerned about climate change and local flooding. It is a community-led initiative which aims to combat climate change by cutting the community carbon dioxide emissions by 80% by 2050, encouraging residents to live more sustainably, and contributing to a more cohesive and resilient community. LCWO runs the Low Carbon Living Programme, a programme that offers its members:

- a detailed carbon footprint showing where they could cut their CO_2 emissions;
- free expert advice and help on how to do it;
- an opportunity to apply for a small grant to help making energy-saving changes;
- help with applying for government grants;
- a free smart meter to help monitoring their electricity usage;
- opportunities to meet other local residents to swap ideas; and
- invitations to attend optional workshops on a number of carbon-busting topics.

Members commit to having their household carbon footprint measured at the start and end of the year and have to set themselves a target for reducing their carbon footprint. They also have to submit monthly readings of their energy use. According to LCWO participating households cut their carbon footprints by 36% in 2009 and some saved up to £200 on their energy bills. LCWO also established West Oxford Community Renewables (WOCR) for the specific purpose of building community-owned renewable energy schemes in West Oxford and to thus generate funds for LCWO.

Both LCWO and WOCR have recently been successful in two national competitions. LCWO and WOCR were runners-up in The Big Green Challenge run by NESTA (National Endowment of Science Technology and the Arts) and received an award of £100,000. WOCR is also one of 22 winners in the Low Carbon Communities Challenge being run by DECC (Department for Energy and Climate Change) and received an award of £803,000. The money will be used to buy equipment for renewable/clean energy projects.

Improving incentives for neighbourhood projects

A specific barrier to neighbourhood projects is the extent to which the scale of generation schemes is prescribed by current policies. If we accept that both individual and neighbourhood scales have a role to play, the incentives to act should recognise this. But at the moment, beyond a certain size, installations suddenly get a lot less financial help: FITs for wind power drop from 18.8 pence per kilowatt hour (p/kWh) for installations of 100 to 500kW to just 4.5 p/kWh for schemes greater than 1.5MW and up to 5MW. Whilst there is a case for a taper with lower incentives for larger installations, this is a large drop off compared to the sliding scale used for smaller installations and appears to be deterring community projects. Similar "stepped" tariffs also apply to hydro-renewables.

This jump in incentives has been criticised by a number of organisations, including Consumer Focus[1] and Friends of the Earth, who propose a more gradual and gradated decline of the tariffs. Friends of the Earth have also pointed out that the drop in tariffs is affecting community projects and could also deter (for example) hospitals or schools from generating their own energy. A smoother scale would allow this kind of neighbourhood-level energy generation to flourish.

RECOMMENDATION - NOW

Smooth the transition of the FITS tariff between different sized installations: a sliding scale should be used for all sub 5MW installations and not only for smaller installations.

Regional work in Leeds

Partnerships can also be tried at the regional level. One in the early stages of development is the Leeds City Region Partnership, which brings together eleven local authorities to work toward the common aim of a prosperous and sustainable city region. City Region is aiming to deliver a Domestic Energy Efficiency Programme jointly across the sub-region. This is intended to be similar to the Kirklees home insulation scheme and is aiming at 300,000 homes insulated by 2015. Whilst it is too early to judge its success, the potential impact of looking at housing on this scale is considerable.

1 Consumer Focus, 2009

Working together

The idea of there being a "right" scale is opposed by the increasing consensus on the need for partnership to solve these challenges. Regardless of sector or employer, there is recognition that multiple players are required to make progress on energy efficiency and microgeneration in the great retrofit of British housing. No-one is seriously arguing that they can do it alone. Whilst there are some elements of competition and slightly partisan views on who should deliver ("we can" was the typical response), these seem to founder when one scratches the surface.

The organisations interviewed saw themselves as capable of making a difference. In fact, "capability" may be the subsidiary theme here. Rather than assuming that one type of actor (say, a local authority, a plc or a grassroots charity) should take a lead on delivery, there was a general recognition that the right mix could be different in different places. Competence and capacity should trump a too-simplistic emphasis on the category of organisation.

Indeed, there seemed to be an assumption that partnerships would be required and in many cases welcomed. In good partnerships there would be a role for all actors to play to their strengths, even if these were perceived differently in some cases. A final message on this score was that the voluntary sector should not be neglected as part of the solution – though not-for-profits may have to realise that the creation of a more vibrant market will enlarge the sphere of commerce, bringing business into play alongside the voluntary sector.

One way of encouraging good partnerships would be to set up a comprehensive, adequately funded, area-based programme. Last year (2009) the House of Commons Environment, Food and Rural Affairs Committee recommended realigning existing programmes into such a programme, led by local authorities. This could replace the current situation where energy companies deliver CERT programmes with one where they pay a levy into a central fund. The Committee proposed to DECC to undertake an assessment of the costs and benefits of realigning existing programmes into an area-based programme, examining the potential benefits to be had from more efficient targeting and delivery[2]. Such an assessment would be helpful and could consider options which include the role of local authorities but do not exclude other bodies. Utility companies could bid to deliver services on an equal footing with other bodies. A competitive process could be introduced to select the organisations and partners best placed to deliver an effective area based programme.

RECOMMENDATION – MEDIUM TERM

Review the options for an area-based approach: Government should review the different options for realigning existing programmes into an area-based approach, drawing on the experience of schemes such as Low Carbon West Oxford and Kirklees. The review should consider the costs and benefits of different options and set out potential funding and delivery routes. The terms of reference could also include:

- Where local communities should simply be allowed to take issues into their own hands, and how the state can minimise barriers to community-led intervention while still delivering the carbon savings required;
- How to ensure that delivery agents of different sizes and from different sectors – including utilities, local authorities, housing associations, charities, contractors, energy services, or social enterprises – can be involved and play to their strengths;
- What criteria should be used to determine organisational capability and not just capacity;
- Whether there is a need to adjust funding according to stock type or deprivation, for instance using a sliding scale to allow for regional or local variation;
- Contract size and number, determining at what level they should be managed and how they can be accountable to funders and local people;
- The role of mechanisms such as the recently announced community energy fund.

This should be done prior to 2012 and **implemented in future commissioning.**

2 House of Commons Environment, Food and Rural Affairs Committee, 2009

SELL THE BENEFITS

Potential £1bn saving to NHS from eradicating cold homes

"Hell doesn't sell."[1] We need to sell the benefits of initiatives which improve the environment, both to individuals and to policymakers. This point is well made in the Futerra report "Sell the Sizzle", which argues that if we want to motivate people to change their behaviour, messages of environmental doom and gloom do not work. Focusing on what will get better, and creating a positive, compelling picture of what the future looks like, is much more likely to capture people's imagination and inspire them to action.

A similar message holds true for policymakers. We should not be surprised that changes perceived as slow, expensive and long term have been relegated to the back burner. Better communication of the choices and benefits involved can help to turn this around. Two areas where this could be fertile are skills/jobs and health.

Skills and jobs

Investing in environmental technology creates jobs. The idea of a "green economy" occurs regularly in political discussion and the press, and this was reflected in the interviews. More people working for a meaningful wage, in what should be a secure and growing sector, is good news.

A programme of environmental improvements for housing would have a massive potential to create green jobs. A United Nations Environment Programme (UNEP) report[2] defines green jobs as "work in agriculture, industry, services and administration that contributes to preserving or restoring the quality of the environment". UNEP found that:

- renewable energy could account for half of the new jobs
- buildings and energy efficiency have particular potential to increase employment whilst reducing greenhouse gas emissions
- the global market for environmental products and services is projected to double by 2020. Half of this market is predicted to be based in energy efficiency
- renewable energy jobs will outnumber those in fossil fuels, based on projected investment.

The example of Germany shows the benefits of investing in environmental technology. The sector is expected to quadruple to 16 per cent of industrial output by 2030, creating more jobs in this sector than historic industries such as manufacturing and automobiles. UNEP also cites the example of the German Alliance for Work and the Environment, which was started during a recession in the building industry, and received increased funding as a result of its success. Over five years, $5.2bn of public subsidy created $20.9bn of investment and brought in $4bn of tax. In the process, 342,000 dwellings were improved, creating or retaining 140,000 jobs and reducing emissions from buildings by 2% just from this scheme. The business case is even more impressive if you imagine the costs of not investing: these costs include state support to find people other jobs, benefits payments, and lost income from National Insurance and tax.

1 Futerra, 2010
2 UNEP, 2008

What about the UK? Currently:

- our energy efficiency industry is estimated to support about 75,000 UK manufacturing jobs. A large proportion of these jobs are in the manufacture of glass and double-glazed windows and doors;
- a further 10,000 people work to install various types of insulation in the domestic sector;
- the double glazing industry employs around 65,000 people in selling, installing and replacing windows and doors;
- and there are currently about 120,000 CORGI-registered gas fitters carrying out installations and repairs on heating systems, gas appliances and general plumbing services.

Many of these people do energy efficiency related work[3]. Whilst some green jobs will represent a transfer of employment rather than net growth (for example, gas fitters taking on new tasks), the potential for growing the figures above is considerable. What's more, the market in generation is underdeveloped. Growth as a result of incentives such as the Feed in Tariff – or potentially the Renewable Heat Incentive – could create even more jobs. Going back to the example of Germany: the country's renewables industry alone (including microgeneration as well as larger scale installations) employs 278,000 people[4]. Identifying these areas for job creation, matching the skills to them and targeting those most in need of work will have social benefits as well as environmental ones.

Whilst some of this growth is likely to come from private investment, there is a role for government in stimulating the market and ensuring that those currently excluded from the workplace can benefit. For this to happen, the Department of Work and Pensions (DWP) will need to work with DECC and CLG in particular to identify where there are win-wins, as new "green collar" jobs are made at a variety of skill levels. The creation of employment is particularly relevant in an economic downturn, when competition for employment is at its highest, and these jobs will have greater societal benefit if they are available to those who need them most.

RECOMMENDATION – MEDIUM TERM

Consider the employment potential of investment in energy efficiency and micro renewable or low carbon generation.
New government schemes could, for example, require contractors to train and employ local people – particularly groups excluded from the labour market such as the long-term unemployed or recent graduates who have been unable to find work. It is common practice, in public-private partnership projects and in Section 106 development agreements, to set conditions on local employment. This practice could be extended to services procured by central or local government for energy efficiency and microgeneration.

Benefit payments

Government could make some existing programmes more effective by sharing information. Another of DWP's functions is the handling of benefit payments: the department holds information on financially disadvantaged households, which are targeted by programmes such as Warm Front. This information is currently not made available to the delivery agent of Warm Front, although it could be used to increase the effectiveness of the programme. This is in contrast to the Digital Switchover (to digital television), where DWP provided information on vulnerable residents to ensure that they were included sensitively in the process.

3 Element Energy Ltd. and Quantum Strategy & Technology Ltd., 2009
4 O'Sullivan, M., Edler, D., Ottmüller, M., Lehr, U., 2010

Information sharing could help in other areas too. For example, the Energy Performance Certificate and Home Condition Report Registers operated by Landmark on behalf of CLG could be used to target delivery on the worst performing properties. At the moment, this data is not accessible to the delivery agents of programmes, or placed in the public domain – despite frequent calls to make it available. Since August 2009, revised regulations allow the disclosure of some of the data from the England and Wales domestic EPC register to the Energy Saving Trust. However, this data only includes F or G rated properties along with their recommendation reports, and is for specified purposes only: i.e. to provide owners and occupiers of those lowest energy rated dwellings with information on energy efficiency and finance options. Government recently consulted on the different options for making better use of EPC data. It is to be hoped that steps will now be taken to share this information with those involved in delivering energy efficiency measures.

RECOMMENDATION – NOW

Information sharing for targeted delivery: Government should share existing data on worst performing properties from the Energy Performance Certificate and Home Condition Report Registers with delivery agents of energy efficiency programmes. This could be combined with data on financially disadvantaged households held by DWP.

Health

Health is another area of people's quality of life which could be greatly improved by changes to housing. The Marmot Report into the social determinants of health has linked climate change and fuel poverty, as well as food, exercise, transport, and overcrowding: these form a network of factors in neighbourhoods which influence people's health.

The very serious health risks that climate change poses to the UK population are, in themselves, a strong reason to consider all avenues for action. But acting on climate change and reducing fuel poverty will also benefit people's health at home. The Marmot Report suggests that eradicating cold homes could save the NHS £1bn annually and reduce winter deaths (36,700 from December 2008 to March 2009). This would benefit vulnerable people in particular – children, older people and those housebound as a result of long term illness or disability. Schemes such as "Health through warmth" and "Keep warm, keep well" show that this is already on the agenda. Indeed, Primary Care Trusts are promoting insulation, as they recognise that prevention is more cost effective than cure. But more could be done.

According to Marmot, improvements in housing conditions have made people healthier in other ways. Better housing correlates with fewer trips to the doctor, better mental health and reduced mortality rates. Children experience less asthma and fewer days off school. These and other beneficial outcomes were confirmed by a randomised control trial of home insulation targeted on households with low incomes.

As the Marmot Report goes on to observe, dealing with the effects of the problem – poor health, stemming from poor housing – is down to the Health Service, whereas responsibility for action sits elsewhere in government (primarily, split between DECC and CLG). Aside from improving the energy efficiency of all housing, and combining this with microgeneration to guard against the risk of rising costs, the main need is for the response to be well integrated. Marmot even proposes the full integration of "planning, transport, housing, environmental and health systems to address the social determinants of health in each locality."

RECOMMENDATION – LATER

Explore an outcomes based funding model based on reduced fuel poverty and improved health. Seeing future costs to the state as a potential revenue stream leads to a "spend to save" philosophy, something that is already underway for welfare to work. This offers the long term promise of recouping some high short term costs. Combining this with a medium term contracting model will help to mobilise private finance against the prospect of future returns.

A NEW WAY OF THINKING

We have seen that changes to housing can improve people's health and create jobs. Though this research focuses on energy efficiency and microgeneration – issues often thought of as "environmental" – the rewards of taking action are much wider. We need to reframe the way we think about the problem as well as the solutions.

The practitioners we spoke to tend to take a fairly holistic view of the problems, as well as the improvements in quality of life for individuals and communities. But this is not reflected in policy, which has framed the problem in terms of the environment or fuel poverty. In most cases, policy is addressing one problem at a time. Whilst a linear approach works for some problems, this is not one of them. Even trying to resolve fuel poverty and carbon reduction in tandem raises challenges.

Establishing an Interdepartmental Working Group on Low Carbon Homes, which would bring together people from all departments with responsibilities on home energy efficiency and microgeneration, could help identify new opportunities and cross-fertilise existing efforts. An example of such an initiative has been started in Northern Ireland, where the Interdepartmental Working Group on Sustainable Energy held its first meeting on 28 January 2009. The group of Ministers will support those departments which have legislative responsibility for energy efficiency and renewable energy matters. It will demonstrate a strategic, joined-up Government approach to sustainable energy in Northern Ireland.

Similarly, the solutions themselves are likely to be more complex and diverse if we are to get the benefits of change – such as those of better health and economic development – rather than the short straw of cost and headache that politicians and the public perhaps perceive.

An example

One example cannot show the full range of possibilities, but here is an illustration to show the different pieces of the puzzle that might need to change, and who might be involved.

For example, take a neighbourhood with 2,500 homes. A new business is set up to encourage energy efficiency and generation; the business offers shares to local people. Some social funds are used, which are counted as equity in a community enterprise. The programme takes on a knowledgeable and committed project manager to identify (with expert input where necessary) everything that can be done locally in terms of energy efficiency or generation. The use of vegetation is maximised, to provide natural shade and beautify the neighbourhood. A community group (or trusted charity or social business) is identified to consult with local people about the best way to do the programme. The programme engages the community to encourage behaviour change (see the section Addressing People's Behaviour) and make reduced consumption the norm so that people get the most out of the physical improvements. Some people begin to use energy differently at home as they become aware of the changes.

The government has ensured that people's benefits are maximised to reduce fuel poverty and remove barriers to work. The programme employs a trainer, who, in discussion with the project manager, recruits exclusively from the local area. The recruitment targets those who have been out of work for a long time and recent graduates left behind by the recession. The cost of their training is cross-subsidises with funding from the DWP's new Work Programme. Recognising that it may take a bit longer to begin with, the programme systematically improves the physical environment of local housing. The programme then offers the same services to business and commercial premises. As the programme, now underway for several years, tapers off, some of the workforce are set up as private contractors or franchisees under a bigger brand. This new brand employs the keenest workers and the process starts again.

People start to feel the benefits at home too, with lower fuel bills and warmer homes. What started out as an environmental problem has become an engine for transforming the neighbourhood and communities.

RECOMMENDATION - NOW

Convene an interdepartmental working group to review existing policies and identify win-wins and added value opportunities, as well as avoiding perverse incentives. This should include, as a minimum, representation from the Department of Health, DWP, CLG and DECC. The aims of multiple government departments can be met through environmental measures. Understanding these overlaps at the policy and funding level is the first step towards aligning objectives and removing contradictions.

RECOMMENDATION - NOW

Create a cross-departmental programme which works through coalition, explicitly acknowledges the knotty nature of social, environmental and economic challenges, and seeks to maximise the potential benefits of intervention. This might ultimately give rise to a different way of thinking about low carbon housing as an engine for community transformation.

A CALL TO ACTION

This report seeks to better understand the challenges of improving the UK's housing stock in a way which respects people and the environment, and to make corresponding recommendations. The authors trust that readers will perceive this as a helpful spur to discussion, even – and perhaps because – their views may differ in some areas. The authors are firmly of the opinion that broadening the debate, including incorporating voices that may have had less input previously, is an essential part of building the momentum for change. For this reason, the authors, on behalf of Eaga, would like to extend an invitation to developing these discussions. Eaga are proposing to run a series of events during 2010 to gather influencers and practitioners, to identify areas of commonality and difference, and where possible to work together for changes which stand to benefit the whole of the UK.

For further information, please contact: **gettingwarmer@eaga.com**

BIBLIOGRAPHY

BERR 2008. Digest of United Kingdom Energy Statistics 2008. London: TSO

Boardman, B., 2007. Home truths: a low-carbon strategy to reduce UK housing emissions by 80% by 2050. Oxford: Environmental Change Institute

CIBSE Energy Centre, 2010. Onsite Energy Generation. Online: http://www.cibseenergycentre.co.uk/onsite-energy-generation-epc.html

CLG, 2009. CLG English House Condition Survey 2007. London: CLG Publications

CLG, 2007. Implementing Decent Homes in the Social Sector. London: CLG Publications

CLG, 2006. Review of Sustainability of Existing Buildings. London: DCLG Publications

Committee on Climate Change, 2008. Building a low-carbon economy : the UK's contribution to tackling climate change. The first report of the Committee on Climate Change. London, TSO

Consumer Focus, 2009. Consumer Focus response to consultation on Renewable Electricity Financial Incentives 2009. Online: http://www.consumerfocus.org.uk/assets/1/files/2009/11/ConsumerFocusresponsetoFITconsultation.pdf

Cumming, L., Dick, A., Filkin, G., Sturgess, G., 2009, Better Outcomes. Online: http://clients.squareeye.com/uploads/2020/documents/Better%20Outcomes.pdf

DECC, 2010a. Impact Assessment of Feed-in Tariffs for Small-Scale, Low Carbon, Electricity Generation (URN10D/536). Online: http://www.decc.gov.uk/en/content/cms/consultations/elec_financial/elec_financial.aspx

DECC, 2010b. Warm Homes, Greener Homes: A Strategy for Household Energy Management Supporting Papers. London: TSO

DECC, 2010c. Warm Front. Online: http://www.decc.gov.uk/en/content/cms/news/100121_dksp/100121_dksp.aspx

DECC, 2010d. Feed-in tariffs: Government's response to the summer 2009 consultation. Online: http://www.decc.gov.uk/Media/viewfile.ashx?FilePath=Consultations\Renewable%20Electricity%20Financial%20Incentives\1_20100204120204_e_@@_FITsconsultationresponseandGovdecisions.pdf&filetype=4

DECC, 2010e. Warm Homes, Greener Homes: A Strategy for Household Energy Management. Online: http://www.decc.gov.uk/assets/decc/what%20we%20do/supporting%20consumers/household%20energy%20management/1_20100331101157_e_@@_warmhomesgreenerhomeshemstrategy.pdf

DECC, 2010f. Renewable Heat Incentive. Consultation on the proposed RHI financial support scheme. Online: http://www.decc.gov.uk/assets/decc/Consultations/RHI/1_20100204094844_e_@@_ConsultationonRenewableHeatIncentive.pdf

DECC, 2009a. Digest of United Kingdom energy statistics: 2009. London: TSO

DECC, 2009b. Energy consumption in the United Kingdom. London: TSO

DECC, 2009c. The UK Renewable Energy Strategy 2009. London: TSO

DECC, 2009d. Consultation Stage Impact Assessment on extending the Carbon Emissions Reduction Target to December 2012. Online: http://www.decc.gov.uk/assets/decc/Consultations/certextension/124-certextia.pdf

DEFRA, 2009a. Sustainable development indicators in your pocket 2009. London: DEFRA

DEFRA, 2009b. Public attitudes and behaviours towards the environment - tracker survey. London: DEFRA

DEFRA, 2007. The Household Energy Supplier Obligation: A call for evidence. London: DEFRA

Element Energy, 2008. Numbers of microgeneration units installed in England, Wales, Scotland, and Northern Ireland. Online: http://www.bis.gov.uk/files/file49151.pdf

Element Energy Ltd. and Quantum Strategy & Technology Ltd., 2009. An assessment of the size of the UK household energy efficiency market. London: Energy Efficiency Partnership for Homes

Energy Saving Trust, 2010. F & G banded homes in Great Britain Research into costs of treatment. London: Energy Saving Trust

Energy Saving Trust, 2006. Rise of the machine. London: Energy Saving Trust

Energy Saving Trust, Element Energy, Econnect, 2005. Potential for Microgeneration. Online: http://www.berr.gov.uk/files/file27558.pdf

Enviros, 2008. The Potential for Behavioural and Demand-Side Management Measures to Save Electricity, Gas and Carbon in the Domestic Sector, and Resulting Supply Side Implications. Online: http://www.decc.gov.uk/media/viewfile.ashx?filepath=what we do/supporting consumers/smart energy meters/1_20091116162210_e_@@_envirossmartmeteringreport.pdf&filetype=4

European Environment Agency 2009. Annual European Community greenhouse gas inventory 1990–2007 and inventory report 2009. Luxembourg: EEA

Eyre, N., 2010. Personal communication, 12/05/2010

Friends of the Earth, 2009. Feed-in Tariffs for small scale renewable energy. Online: http://www.foe.co.uk/resource/briefings/feed_in_tariff_mps_briefing_dec_09.pdf

Futerra, 2010. Sell the Sizzle. Online: http://www.futerra.co.uk/downloads/Sellthesizzle.pdf

Green Investment Bank Commission, 2010. Unlocking investment to deliver Britain's low carbon future. Online: http://www.climatechangecapital.com/news-and-events/press-releases/green-investment-bank-commission-report-ccc-e3g-joint-announcement.aspx

HM Treasury, 2010. Budget 2010. Online: http://www.hm-treasury.gov.uk/d/junebudget_complete.pdf

House of Commons Environment, Food and Rural Affairs Committee, 2009. Energy efficiency and fuel poverty. Third Report of Session 2008–09. London: TSO

IPCC, 2007. Climate change 2007. Mitigation of climate change : contribution of Working Group III to the Fourth assessment report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press

Janda, K., 2009. Buildings Don't Use Energy: People Do. Online: http://www.eci.ox.ac.uk/publications/downloads/janda09buildingsdont.pdf

Killip, G, 2008, Building a Greener Britain, Online: http://www.fmb.org.uk/news/campaigns/building-a-greener-britain/

National Audit Office, 2010. Memorandum for the House of Commons Energy and Climate Change Committee. Online: http://www.nao.org.uk/publications/0910/ecc_memorandum.aspx

National Audit Office, 2008. Programmes to reduce household energy consumption. Online: http://www.nao.org.uk/publications/nao_reports/07-08/0708787.pdf

OFGEM, 2009. A review of the first year of the Carbon Emissions Reduction Target. Online: http://www.ofgem.gov.uk/Sustainability/Environment/EnergyEff/Documents1/CERT%20Annual%20report%20v1.pdf

O'Sullivan, M., Edler, D., Ottmüller, M., Lehr, U., 2010. Kurz- und langfristige Auswirkungen des Ausbaus der erneuerbaren Energien auf den deutschen Arbeitsmarkt, dritter Bericht zur Bruttobeschäftigung. Online: http://www.erneuerbare-energien.de/files/pdfs/allgemein/application/pdf/ee_beschaeftigung_2009_bf.pdf

Poyry and Element Energy, 2009. Design of Feed-in Tariffs for sub-5MW Electricity in Great Britain. Quantitative analysis for DECC. Poyry and Element Energy. Online: http://www.decc.gov.uk/Media/viewfile.ashx?FilePath=Consultations\Renewable%20Electricity%20Financial%20Incentives\1_20090715135352_e_@@_RelateddocElementPoyryreportonquantitativeissuesinFITsdesignFINAL.pdf&filetype=4

Purple Market Research, 2008. UK Domestic Solid Wall Insulation. Online: http://www.eeph.org.uk/uploads/documents/partnership/Solid%20Wall%20Insulation%20Sector%20Profile%20May%202008%20FULL%20REPORT.pdf

Quadrangle, 2009. Solid Wall Insulation – London Pilot Mailer. Online: http://www.energysavingtrust.org.uk/Publication-Download/?publication=JN%204901%20Solid%20Wall%20Insulation%20-%20v4.pdf

Ragwitz, M., Huber, C., 2005. Feed-In Systems in Germany and Spain and a comparison. Online: http://www.bmu.de/files/english/renewable_energy/downloads/application/pdf/langfassung_einspeisesysteme_en.pdf

Schumacher, E.F, 1973. Small is beautiful. Economics as if people mattered. New York: Harper & Row

UNSTATS, 2009. Environmental Indicators. GHGs. Online: http://unstats.un.org/unsd/environment/air_greenhouse_emissions.htm

UNEP, 2008, Green Jobs: Towards decent work in a sustainable, low-carbon world. Online: http://www.unep.org/labour_environment/features/greenjobs-report.asp

Vaze, P. and Mayo, E., 2009. A new energy infrastructure, London: Consumer Focus

NB all electronic references were accurate as of August 2010.

ABBREVIATIONS

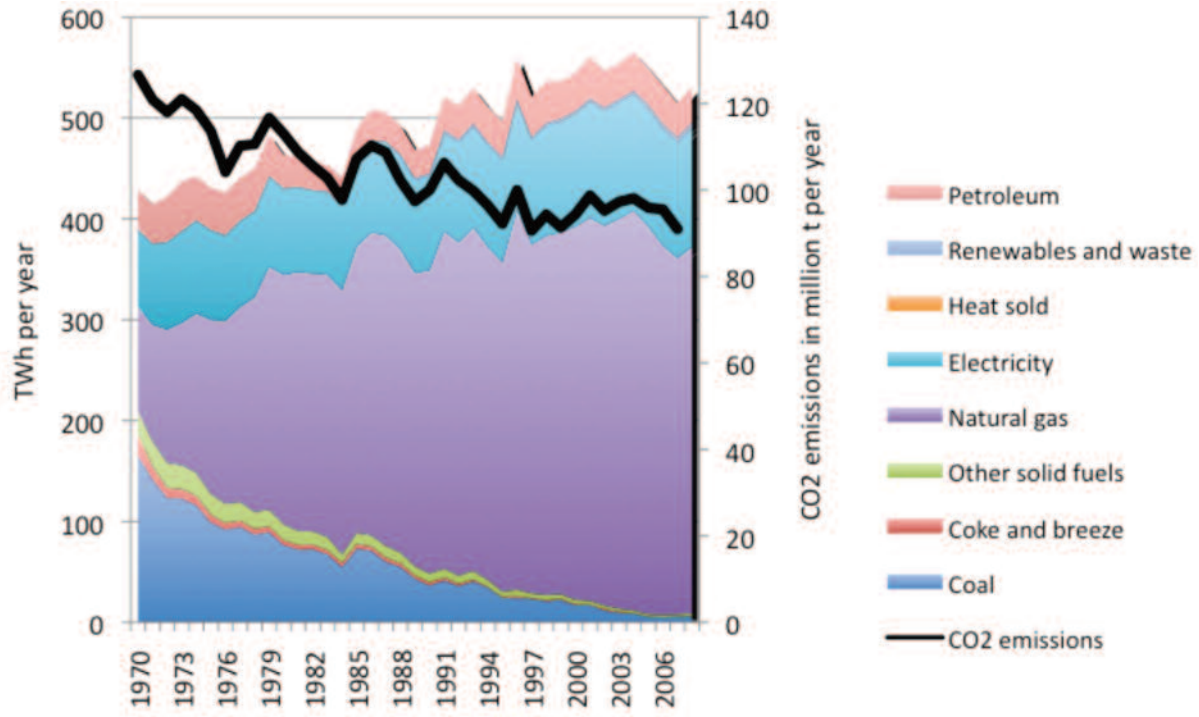
BERR	Business, Enterprise and Regulatory Reform
BIS	Business, Innovation and Skills
CERT	Carbon Emissions Reduction Target
CESP	Community Energy Saving Programme
CHP	Combined Heat and Power
CLG	Communities and Local Government
CORGI	Certificate of Registered Gas Installers
DECC	Department for Energy and Climate Change
Defra	Department for Environment, Farming and Rural Affairs
DWP	Department of Work and Pensions
EEC	Energy Efficiency Commitment
EESoP	Energy Efficiency Standards of Performance
EPC	Energy Performance Certificate
ESCO	Energy Supply Company
FITS	Feed-in-tariffs
GHG	Greenhouse Gas(es)
HECA	Home Energy Conservation Act
HEES	Home Energy Efficiency Scheme
IPCC	International Panel on Climate Change
LCBP	Low Carbon Buildings Programme
MCS	Microgeneration Certification Scheme
MW	Megawatt(s)
NHS	National Health Service
p/kWh	pence per kilowatt hour
PAYS	Pay as you save
RHI	Renewable Heat Incentive
UNEP	United Nations Environment Programme
VAT	Value Added Tax

APPENDICES

APPENDIX 1: UK HOUSEHOLD ENERGY CONSUMPTION SINCE 1970

Household energy consumption has been rising steadily, by 19% from 1970-2008. This is a result of a higher number of households and a growing population[1] . Although carbon emissions fell by almost 30% over the period 1970-2008, mainly as a result of switching from coal and other solid fuels to natural gas as the main heating fuel (Figure 1), these improvements are insufficient and cannot be maintained. As the same figure shows, gas now accounts for two thirds of the fuel consumed by households (and gas is also used to generate some of our electricity). A more profound shift is required.

Figure A: Total household energy consumption by fuel and related CO2 emissions in the UK from 1970-2007



Source: based on DECC (2009b) and DEFRA (2009)

The bulk of fuel used in households is now gas which is why further reduction by substituting solid fuels with gas will not be an option to bring down carbon emissions.

1 DECC, 2009a

APPENDIX 2: POLICY OVERVIEW

The following bullets offer some general comments on recent policies. This is followed by short summaries of recent policies, most of which are shown in the policy diagram above.

- Generally, energy generation and energy efficiency have been addressed quite separately. CERT, Warm Front, HECA and Building Regulations all affect energy efficiency. While energy suppliers can invest in microgeneration and small scale CHP under CERT, those measures accounted only for 0.2% of achieved carbon savings in the first year of the scheme.[1],[2] The Lower Carbon Buildings Programme, Feed In Tariffs (FITS) and the proposed Renewable Heat Incentive all focus strongly on generation and indicate a more recent interest by policymakers in generation from renewable sources. However, there are attempts at integrating the two: the Renewable Heat Incentive puts basic energy efficiency requirements on properties if they are to be eligible and the PAYS proposals consider both energy efficiency and microgeneration. Previously, formulating general energy policy was the responsibility of the Department of Trade and Industry (DTI), more recently the Department of Business, Enterprise and Regulatory Reform, or BERR. The DTI had the primary objective of developing a competitive business environment in the UK focusing on energy security and low energy prices. Energy efficiency and behaviour change were dealt with by the Department for Food, Environment and Rural Affairs (DEFRA) which has responsibilities in the area of environmental pollution. Since the Department of Energy and Climate Change (DECC) was created in October 2008, both wider energy policy and energy efficiency policy is within the realm of one single government department. This can be seen as a first step towards more integration.
- Policy drives funding from government and the utility companies - this underscores the fact that the market in energy efficiency is created by legislation, and the expectation that the same will be true of microgeneration. Utility companies are mandated to contribute, working to the polluter pays principle, for instance via CERT. This to a large extent creates a market. Utility companies use some money themselves but also have to contribute to local authority, housing association and private providers making improvements.
- Different treatment of different tenures: Most policies deal with owner occupied dwellings and/ or social housing. For example, CERT focuses mainly on the owner-occupied sector and social housing, Warm Front on private housing, and FITS on owner occupied dwellings. While in theory the private rented sector is covered by policy as well, there are substantial barriers to this type of tenure. Tenants interested in installing low carbon technologies may face various problems: first, they need to get permission from the landlord to install energy efficiency measures or microrenewables. Second, the benefits of the energy savings might not justify an investment if the length of the tenancy is only a few years (although Warm Front and CERT for example offer grants if tenants are in the group of disadvantaged customers). The landlord does not benefit from lower fuel bills, making it difficult to recoup any investments, regardless of subsidies, hence the incentive for them to take action is low.

There is also a notable energy subsidy, in the form of Winter Fuel Payments. This is intended to pay for consumption of energy for members of the population born on or before 5 July 1950. Whilst the motive of helping older people to keep warm is incontrovertible, the efficacy of the scheme and the notion of a costly subsidy (over £2bn each year) are questionable. Several interviewees felt that this money could be better spent on improvements; it was also suggested that it could be means tested to ensure better targeting of resources on those who need the help. Making homes more energy efficient and fitting generating technologies which are cheaper in the long term would make Winter Fuel Payments unnecessary and this is one funding stream where some reallocation should be considered.

1 Heat pumps have been installed in 550 households and solar water heating in 216. There was 1 small scale CHP project. The majority of those measures were delivered to the non-Priority Group.
2 OFGEM, 2009

ENERGY EFFICIENCY

CERT

The Carbon Emissions Reduction Target (CERT) is the successor of the Energy Efficiency Commitment (EEC) and runs from April 2008 to December 2012., a recent extension to the original term which ended in March 2011. It obliges gas and electricity suppliers who have more than 50,000 domestic customers to meet a household carbon emissions reduction target of 293 million tonnes over the life of the measures implemented. Suppliers achieve these targets by promoting (e.g. through subsidised offers) low carbon and energy efficiency measures such as loft and cavity wall insulation to households. At least 40% of the carbon saving obligation has to be achieved in a priority group of low income, vulnerable and elderly (aged 70 or over) households. CERT is estimated to stimulate about £3.2 billion in investment by energy suppliers in promoting low carbon measures, with the CERT extension (April 2011 – December 2012) requiring an additional £2.3 billion investment. Following the extension of CERT, 68% of energy suppliers' work will now have to be met through professionally installed loft, cavity and solid wall insulation. With DIY insulation added, more than 80% of the scheme will be focused on insulation. Previously just 60% was met through professional and DIY work. 15% of homes helped will be the lowest income households more at risk of fuel poverty and energy companies will be stopped from promoting compact fluorescent lamps in order to prioritise insulation, further to the total ban on light bulb mail-outs.

CESP

CESP targets households across Great Britain, in given geographical areas, to improve energy efficiency standards, and permanently reduce fuel bills. There are 4,500 areas eligible for CESP. CESP is funded by a new obligation on energy suppliers and, for the first time, an obligation on electricity generators. The programme is delivered through the development of community-based partnerships between Local Authorities (LAs), community groups and energy companies, via a house-by-house, street-by-street approach. Around 100 schemes are expected, benefiting around 90,000 homes and saving nearly 2.9m tonnes of CO2 emissions. CESP is expected to deliver annual average fuel bill savings for those households involved of up to £300. CESP commenced on 1 September 2009. The first 10 CESP areas were announced by British Gas on 21 October 2009. They intend to work in the following local authority areas: Birmingham, Walsall, Dundee, Glasgow, Preston, Knowsley in Merseyside, Swansea, Blacon in Cheshire, and the London Boroughs of Haringey and Southwark.

DECENT HOMES

This is a DCLG policy begun in 2001 with the target of bringing 95% of all social housing up to a 'decent' standard by 2010. A decent home is defined as 'warm, weatherproof and has reasonably modern conditions'. The Decent Homes standard is designed to trigger action, not as a target to be met. provide a "reasonable degree of thermal comfort" (defined as having an efficient heating system and effective insulation). Houses with gas- or oil-fired programmable central heating need to have either cavity wall insulation or at least 50mm loft insulation (if feasible). Homes with liquefied petroleum gas (LPG), solid fuel-fired programmable central heating, or electric storage heaters require either cavity wall insulation or at least 200mm loft insulation (if feasible). At present, a lower standard of insulation is required in 'hard to treat' homes; those without cavity wall construction and/or without loft space. Defra expects 95% of social homes to be decent with regard to energy efficiency requirements by 2010. Expected savings beyond 2010 in addition to what has been already achieved are likely to be minor, based on evidence from the National Audit Office[3]. It did not encourage microgeneration.

3 National Audit Office, 2008

WARM FRONT

Warm Front is the Government's main grant-funded programme for tackling fuel poverty and managed by Eaga. Grants are available for vulnerable private sector households to install energy efficiency measures, including central heating and insulation. The Warm Front Scheme provides a package of insulation and heating improvements up to the value of £3,500 (or £6,000 where oil, low carbon or renewable technologies are recommended). In the Pre-Budget Report, the Chancellor announced additional funding in 2010/11 for Warm Front of £150 million as a supplement to the £195m already earmarked for Year 3 of the spending period. In sum, more than £1 billion has been spent on the Scheme since 2008[4].

HOME ENERGY CONSERVATION ACT 1995

The Home Energy Conservation Act 1995 (HECA) requires every UK local authority with housing responsibilities i.e. 'energy conservation authorities' to prepare, publish and submit to the Secretary of State an energy conservation report identifying: practicable and cost-effective measures to significantly improve the energy efficiency of all residential accommodation in their area; and report on progress made in implementing the measures. HECA does not incentivise particular measures; rather it is a reporting tool which enables government and local authorities to better understand energy efficiency improvements in the housing stock.

RENEWABLES

EU RENEWABLE ENERGY DIRECTIVE

In 2007, the UK committed itself to a legally-binding target to ensure 15% of our energy comes from renewable sources by 2020: almost a seven-fold increase in the share of renewables in scarcely more than a decade.

LOWER CARBON BUILDINGS PROGRAMME

This offers grants towards the cost of installing domestic microgeneration technologies and larger scale distributed generation installations for public buildings and businesses, provided energy conservation standards are also met. The programme commenced on April 1, 2006. Phase one is managed by the Energy Saving Trust. Phase two, launched in 2007 is managed by the Building Research Establishment.

The programme is split into two phases - phase one, which is further divided into two streams, provides grants for householders under stream 1, and grants for businesses under stream 2. Phase two provides grants for public sector, charitable and third sector organisations. The householder stream is due to be open until late 2010 for heat generating technologies (solar thermal hot water, ground source heat pumps, air source heat pumps, wood fuelled heating) or as long as funds last. Renewable electricity technologies no longer qualify for funding due to the start of the Feed-in-Tariffs policy.

4 DECC 2010c

FEED-IN-TARIFFS

Feed-in tariffs (FITs) work by guaranteeing a long-term premium payment electricity generated from renewable sources and fed into the grid. From 1 April 2010 householders and communities who install low carbon electricity technology such as new anaerobic digestion, hydro, solar photovoltaic (PV) and wind projects up to 5 MW capacity will be paid for the electricity they generate, even if they use it themselves. If fed into the grid they will get an additional export premium. The level of payment depends on the technology and is linked to inflation. FITs will work alongside the Renewables Obligation, which will remain the primary mechanism to incentivise deployment of large-scale renewable electricity generation, and the planned Renewable Heat Incentive (RHI). It is expected that by 2020 the scheme will support over 750,000 small scale low carbon electricity installations and will have saved 7 million tonnes of carbon dioxide [5].

RENEWABLE HEAT INCENTIVE

The Department of Energy and Climate Change also published plans in February 2010 for a scheme to incentivise renewable heat generation at all scales. This will come into effect in April 2011 and guarantee payments for those who install technologies such as ground source heat pumps, biomass boilers and air source heat pumps. On 1 February 2010, the Government published a consultation on the introduction of the Renewable Heat Incentive. The deadline for responses to this consultation was Monday 26 April. In the 2010 Spending Review, the Government confirmed that it intended to proceed with this policy.

NEW AND POTENTIALLY FORTHCOMING ENERGY EFFICIENCY AND RENEWABLES POLICIES

The new government has yet to propose policies on this area so the status of these policies is uncertain. Pay As You Save (PAYS) is being piloted whereas the Warm Homes Standard was proposed under the Labour administration.

WARM HOMES STANDARD

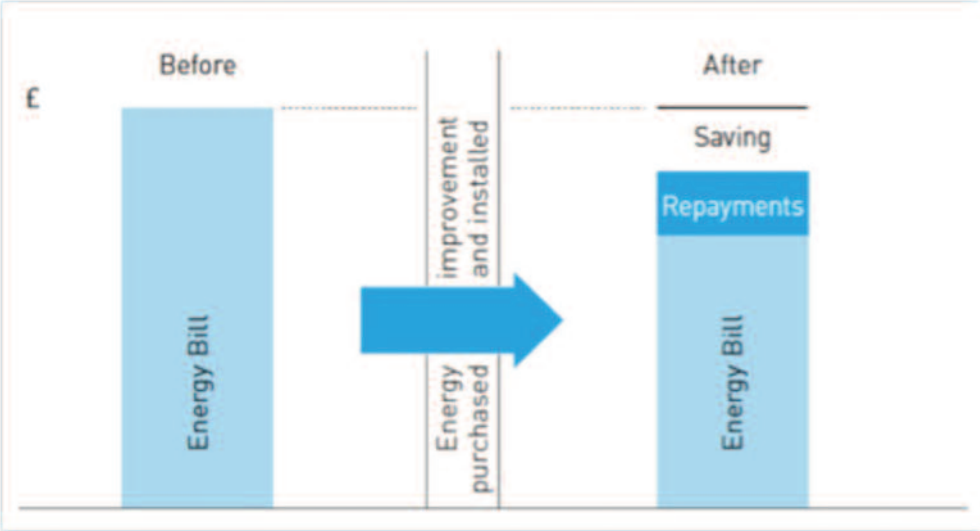
In its Household Energy Management Strategy the Labour Government announced that it will develop with the sector and other interested parties a Warm Homes Standard for social housing to complement the existing Decent Homes standard. Government will work with social landlords and other stakeholders to develop the standard. The standard might cover a range of energy saving measures for different types of home, installation of smart meters, replacement of fossil-fuel heating with renewables supported by the renewable heat incentive, installation of small scale renewable electricity generation supported by FITs. Government expects that additional costs to landlords of achieving the Warm Homes standard to will be met by energy companies under the new obligation[6].

5 DECC, 2010d
6 DECC, 2010b

PAY AS YOU SAVE (PAYS)

The previous Labour administration proposed PAYS and set up a number of pilots. The idea of PAYS is to allow the cost of energy efficiency measures and the installation of renewables to be attached to the home, not the homeowner. The loan is passed on with the house when it is sold or rented. Householders would then only be responsible for the repayments while benefiting from the measures. By attaching the costs to the home the problem of split incentives (landlord-tenant problem) and high upfront costs can be theoretically overcome. This is how the scheme would look:

Figure B: Pay As You Save model



Source: DECC 2010b

In December 2009 the Government launched the PAYS pilots. The pilots have a budget of £4 million and will run until April 2011. These pilots are testing consumer interest in PAYS. PAYS will require new, primary legislation to enable attachment of loans to the property. The current Government may consider elements of the Pay As You Save model in its Green Deal proposals.

OTHER POLICIES

Other policies with a bearing on energy efficiency and microgeneration not covered above include:

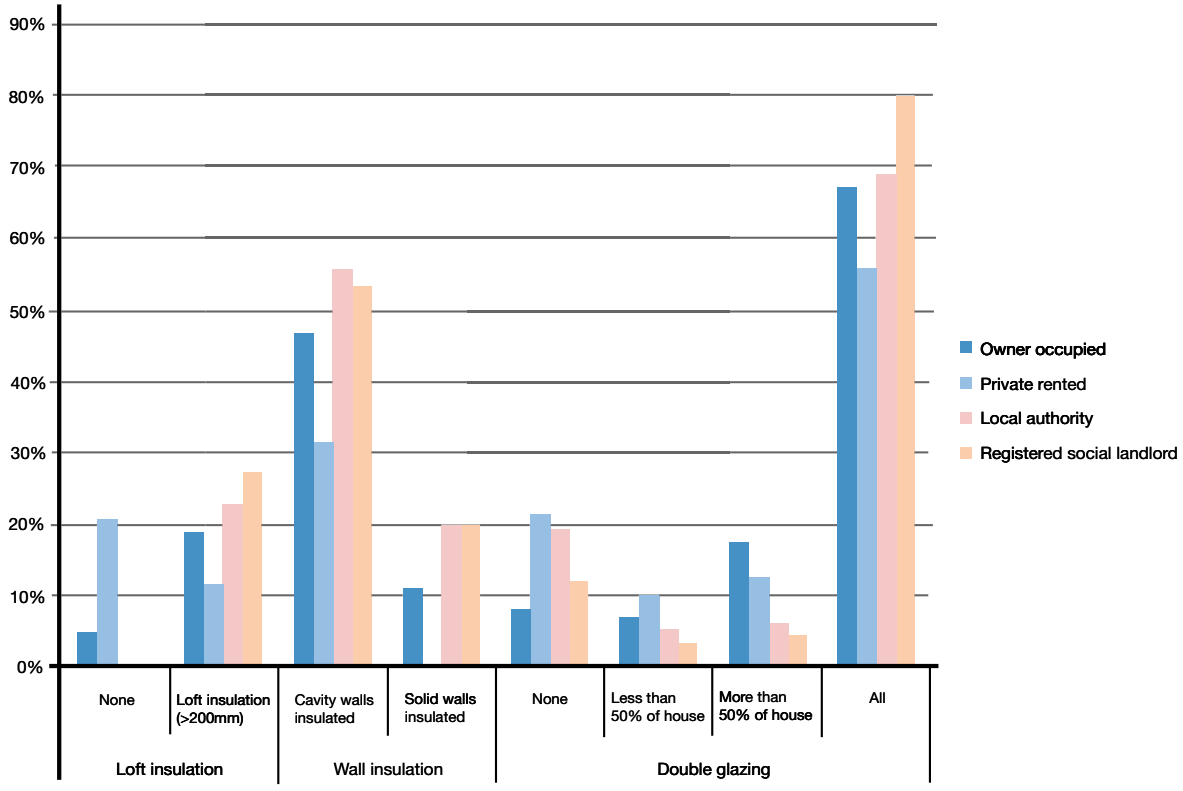
- Building Regulations
- Energy Labelling Directive
- Energy Performance Certificates
- Better billing and metering
- Eco-Design of Energy Using Products EU Directive
- Microgeneration Certification Scheme (MCS)

APPENDIX 3: TECHNOLOGIES AND UPTAKE OF MEASURES

The private rented sector performs worst in terms of energy efficiency – over 20% have no loft insulation
Microgeneration has been adopted by less than 1% of UK households

A robust measure of the efficacy of policy and funding is the extent to which it has changed our housing stock and encouraged small-scale energy generation. There has been some positive movement in terms of efficiency, as reflected in the figure below.

Figure C: uptake of key energy efficiency measures by tenure



Source: based on CLG, 2009, CLG, 2007 and Quadrangle, 2009

The socially rented sector has received most of the energy efficiency measures with more than 80% of all cavity walls expected to be filled by 2010, more than 90% of dwellings with double glazing and about 85% with loft insulation >200mm[1]. The private rented sector performs worst in terms of energy efficiency – more than 20% have not received any loft insulation at all. Also, the private rented sector has twice as many of the very worst condition properties (EPC band G) compared to the rest of the UK's housing stock[2]. As a result of policies such as CERT and Warm Front there will be additional uptake of energy efficiency measures in all sectors, including the private rented sector. However, according to the latest impact assessment on the extension of CERT to 2012 carried out by DECC, households living in private rented accommodation are those who are most likely to see their energy bills increase as a result of CERT, but may not receive corresponding energy saving measures under the scheme[3].

Particularly in the socially rented sector the low cost measures are reaching saturation and further energy savings will require deployment of high cost measures as well. Given current installation rates it is estimated that only 15% of existing solid wall properties will be insulated by 2050 unless there is major acceleration of solid wall insulations and possible market transformation[4]. The socially rented sector is expected to have insulated about 30% of its solid walls by 2010[5].

The disparity between social rented stock and privately owned and rented housing is not fully reflected in the graph due to the limitations of the available data. Take up between 2007 and 2010 has been much greater in the social rented sector. This is likely to be reflected in future versions of the English House Condition survey.

The uptake of microgeneration technologies in the UK remains at a very low level while the potential is significant[6].

Table A: number of microgeneration installations in the UK

Technology	Number
Solar PV	2,993
Micro-CHP	200-1,000
Wind	2,323
Micro-Hydro	73
Solar Thermal	97,500-102,000
Biomass	1,400
Ground Source Heat Pumps	3,415
Air Source Heat Pumps	169

Source: Element Energy, 2008

1 CLG, 2007
2 Energy Saving Trust, 2010
3 DECC, 2009d
4 Purple Market Research, 2008
5 CLG, 2007
6 Energy Saving Trust, Element Energy, Econnect, 2005

Relative to the number of homes in the UK (24m), this is very low at less than 1%. Increasing the uptake of microgeneration could have considerable benefits both in terms of carbon and energy security. Recent research by Poyry and Element Energy commissioned by DECC identified a total potential energy generating capacity from renewable sources of 130 TWh per year, with PV and biomass Combined Heat and Power (CHP) contributing over 100 TWh to this target. The remaining 30 TWh would be provided by other renewable sources such as micro-wind and small scale hydro. In addition, there is also a very large potential contribution to be made by small scale (sub-50kW) gas-fired CHP, a low carbon means of generation, of nearly 90 TWh per year. Taken together, this potential is equivalent to nearly half of UK electricity generation[7].

This indicates that whilst there has been some success, particularly in social housing, there is still a considerable distance left to travel. It should also be noted that much of the low hanging fruit has been taken: not surprisingly, cheaper measures have been installed first as people and institutions have asked what can be done quickly. By extension, this means that more far-reaching and costly solutions will have to be implemented if we are to continue to make in-roads in reducing carbon emissions and fuel poverty.

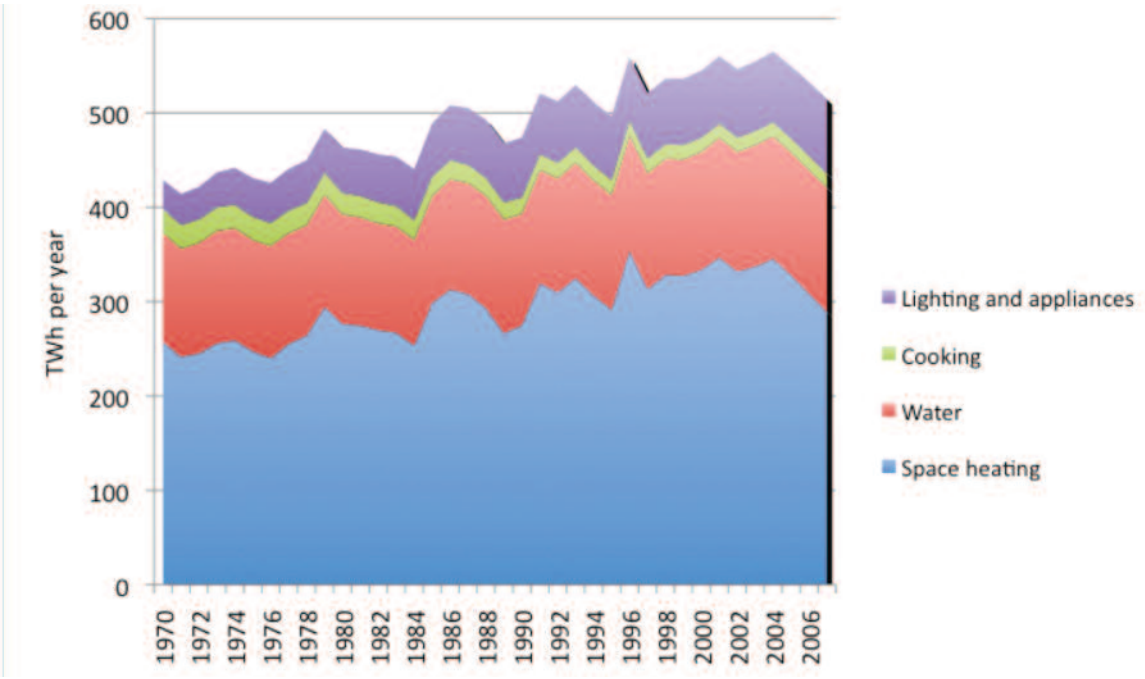
APPENDIX 4: DOMESTIC USE OF ENERGY

Heating is the biggest use of energy in the UK homes

Most domestic energy was and still is used for space heating. Energy demand for space heating has gone up since 1970 as a result of increases in internal temperatures, the growth in central heating, and the increased number of people and households (DECC, 2009a). The increasing number of appliances has also been driving energy consumption, with electricity consumed for lighting and appliances more than doubling during this period. Energy demand for hot water remained more or less the same while energy demand for cooking declined by more than 40% from 1970-2007, mainly as a result of more people eating out and the uptake of convenience food. In total, energy demand has increased substantially since 1970 but there are signs of demand reduction in more recent years (Figure 2).

7 Poyry and Element Energy, 2009

Figure D: Total household energy consumption by end-use and in the UK from 1970-2007



Source: based on DECC (2009b)

The energy demand spikes in certain years are mainly a result of cold winters. The recent drop is, however, not just a result of temperature variations but a combination of policy factors (especially increased CERT and mandatory condensing boilers) and reduced demand due to increased prices[1] have also played a role. This is a promising development, although increasing electricity demand has already offset some of the efficiency savings and is expected to grow further.the English House Condition survey.

The uptake of microgeneration technologies in the UK remains at a very low level while the potential is significant.

1 Eyre, 2010

APPENDIX 5: FULL LIST OF RECOMMENDATIONS

The full list of recommendations is provided below. Please refer to the main body of this document which provides the context and analysis for each recommendation made.

ACTIONS NOW

These are actions which should ideally take place before the end of 2010.

REVIEW

1. **Inter-departmental working group** to review existing policies and identify win-wins and added value opportunities, as well as avoiding perverse incentives. This should include, as a minimum, representation from the Department of Health, DWP, CLG and DECC.
   The aims of multiple government departments can be met through environmental measures and these will have an effect on spending of these departments. Understanding these overlaps at the policy and funding level is the first step towards aligning objectives and removing contradictions.

REGULATE

2. **Set basic energy efficiency requirements for FITs and RHI:** FITs and the RHI offer opportunities for a more integrated approach that begins with improving energy efficiency, reducing consumption and then improving generation.

3. **Smooth the transition of the FITS tariff** between different sized installations with a view to increasing uptake of community microrenewables and CHP schemes in housing: DECC should introduce a sliding scale for all sub 5MW installations.

4. **Divert the funding from Winter Fuel Payments to improving properties:** Means test Winter Fuel Payments with immediate effect. Improve the physical condition of the homes of those in need as rapidly as possible using this funding. This should be combined with checks on vulnerability and benefit maximisation. As the property is improved, the Winter Fuel Payments should be phased out. In welfare to work, David Freud has advocated paying DWP contractors using Annually Managed Expenditure, which includes benefits, rather than just the Departmental Expenditure Limits. A similar principle could be adopted with regards to Winter Fuel Payments – spending on physical changes to reduce ongoing costs.

IMPLEMENT

5. **Energy Efficiency Supplier Certification Scheme:** in the context of the Green Deal, Government should support industry to set up a certification scheme for energy efficiency similar to the MCS. There is now increasing appetite for such a scheme in the industry, so key players including Eaga should collaborate, taking the initiative to bring this about. Certified installers should be granted privileged access to energy efficiency funding streams making it a requirement over time. This can help raising customer confidence and contribute to the uptake of energy efficiency measures.

6. **Develop a voluntary energy efficiency standard for refurbishment:** Government should develop a voluntary standard immediately. This is relatively inexpensive to achieve but would indicate the direction of travel. This standard could guarantee privileged access to funding streams such as Green Deal, FITS, RHI etc., which in turn would be likely to increase uptake.

7. **Information sharing for targeted delivery:** Government should share existing data on worst performing properties from Energy Performance Certificate and Home Condition Report Registers with delivery agents of energy efficiency programmes. This could be combined with data on financially disadvantaged households held by DWP.

ACTIONS MEDIUM TERM

For preference, these actions should take place in 2011 and 2012. The key dates here are the ending of current policies such as Warm Front, CERT and CESP and the introduction of new ones.

REVIEW

8. **Review the place of behaviour change in outcomes-based commissioning,** ensuring that all relevant parts of government, including DECC and Defra, feed into this. Rather than specifying services or activities, outcomes based commissioning puts the emphasis on identifying the intended outcome of a contract, and procuring for this. Full payment is made subject to achievement of the agreed outcomes. Bidders could be encouraged to develop models which cut across supply and demand, so the physical improvement of installing a new technology is also the cue for education about the financial and energy savings that are possible as a result of changed behaviour. For instance, if one of the primary purposes of installing smart meters is to reduce energy usage, then part of the contract payment could be reserved for, say, one year and be subject to a certain average percentage reduction in consumption. The mechanisms used to achieve this would be at the discretion of contractors, but, for instance, they could to choose to offer rewards to participants who make significant savings.

9. **Review the options for an area-based approach:** Government should review the different options for realigning existing programmes into an area-based approach, drawing on the experience of schemes such as Low Carbon West Oxford and Kirklees. The review should consider the costs and benefits of different options and set out potential funding and delivery routes. The terms of reference could also include:

    - Where local communities should simply be allowed to take issues into their own hands, and how the state can minimise barriers to community-led intervention while still delivering the carbon savings required;
    - How to ensure that delivery agents of different sizes and from different sectors – including utilities, local authorities, housing associations, charities, contractors, energy services, or social enterprises – can be involved and play to their strengths;
    - What criteria should be used to determine capability and not just capacity;
    - Whether there is a need to adjust funding according to stock type or deprivation, for instance using a sliding scale to allow for regional or local variation;
    - Contract size and number, determining at what level they should be managed and how they can be accountable to funders and local people.
    - The role of mechanisms such as the recently announced community energy fund

This should be done prior to 2012 and implemented in future commissioning.

COMMISSIONING

10. **Consider the employment potential of investment in energy efficiency and micro renewable or low carbon generation.** New government schemes could, for instance, require contractors to train and employ local people, particularly groups excluded from the labour market such as the long-term unemployed or recent graduates who have been unable to find work. It is common practice in public-private partnership projects and in Section 106 development agreements to stipulate conditions regarding local employment and this could be extended to services procured by central or local government for energy efficiency and microgeneration.

11. **Government to review the potential of a Social Impact Bond and a franchise model in commissioning,** with a view to implementing them in 2011 or 2012. The former could specify outcomes to reduce carbon emissions and/or fuel poverty, and the state would pay on results. This could be combined with, or kept separate from, a franchise model which presents an interesting and apparently viable option for area-based approaches.

12. **Combine benefit maximisation advice with fuel poverty initiatives.** In some cases this could happen quickly as an added value element to existing schemes. Over time, it is suggested that advice on benefits should go beyond signposting to helping people understand their eligibility and potentially liaison with agencies on their behalf. This could be part of future commissioning.

IMPLEMENT

13. Given Government's commitment to **establish a green infrastructure bank**, these proposals should be advanced to stimulate and underwrite green mortgages and investment in low carbon housing until the market has matured to a level where this is no longer necessary. Ideally there should be a rapid establishment of such an organisation, as suggested in the Green Investment Bank Report.

14. **Use the Green Bank to provide low cost loans for microgeneration and higher cost energy efficiency measures:** like the energy efficiency funding model in the Green Investment Commission Report, the Green Investment Bank should offer finance packages to householders for microgeneration. By providing support and potentially subsidies to the less able to pay, FITS could be made widely accessible. The Wigley report also acknowledges the need for finance as an important factor in supporting community renewable energy projects which can benefit multiple homes.

ACTIONS LATER

The time period envisioned for these is three to five years.

REVIEW

15. **Explore an outcomes based funding model** based on reduced fuel poverty and improved health. Seeing future costs to the state as a potential revenue stream leads to a "spend to save" philosophy, something that is already underway for welfare to work. This offers a long term prospect of resolving the current high costs incurred. Combining this with a medium term contracting model will help to mobilise private finance against the prospect of future returns.

REGULATE

16. **Introduce a Code for Sustainable Refurbishment:** As already in place for new build, a Code for Sustainable Refurbishment should be developed. While it should be voluntary at first it should be made obligatory for all tenures, including making it incumbent on landlords in the private rental market, and tightened over time. This should be in line with the carbon reduction targets.

17. **Develop progressive fiscal incentives:** Particularly for the high cost measures more financial incentives are needed, which will need to take account of taxation. This will help to stimulate the market, bring down costs and build the supply chain. Potential incentives built on existing mechanisms might include reduced VAT rates, lower Stamp Duty for low carbon homes, and reduced Council Tax, with Local Authorities allowed to change Council Tax bands based on energy performance of buildings.

IMPLEMENT

18. **Create a cross-departmental programme** which works through coalition, explicitly acknowledges the knotty nature of social, environmental and economic challenges, and seeks to maximise the potential benefits of intervention. This might ultimately give rise to a different way of thinking about low carbon housing and neighbourhoods as an engine for community transformation.