SUSTAINABLE HOUSING ACTION PROGRAMME 2007-08

WEST MIDLANDS LOW CARBON HOUSING MARKET FRAMEWORK

Sustainability West Midlands

energy saving trust®

accord

West Midlands Regional Assembly

Birmingham Science City ideasforlife

wates living space

Published March 2008

Sustainability West Midlands
Tel: 0121 449 4406
Email: info@swm.org.uk
Web: www.sustainabilitywestmidlands.org.uk

Sustainability West Midlands (SWM) is the Regional Sustainability Partnership for the West Midlands with members from business, community, voluntary and public sector organisations who are leaders in the delivery of Sustainability in the region.

Through its members and through its partnerships with the key Regional Bodies including the West Midlands Regional Assembly, Advantage West Midlands, the Government Office for the West Midlands and the Environment Agency, SWM acts as a champion body for sustainable development in the Region and seeks to communicate, promote and champion the principles of sustainable development and good corporate governance.

This report was written and designed by Nick Dodd of URBED (Urbanism, Environment, Design) and Ben Ross of Forum for the Future for the West Midland's Sustainable Housing Action Programme (SHAP), with support from John Sampson and Stephanie Fischer (URBED) and Martin Hunt (Forum for the Future).

The authors are grateful to John Sharpe from Sustainability West Midlands and the SHAP Steering Group (see Bibliography and Credits for the listing of Group members) for their input and feedback throughout the preparation of this report.

Sustainability West Midlands wishes to acknowledge the financial support of the Energy Savings Trust, Birmingham Science City, Accord Housing Association and Wates Living Space in the preparation and publication of this report.

This report has been printed on paper manufactured from 100% post-consumer waste using vegetable based inks.

Cover and Character Area images courtesy of Google Earth

Contents

West Midlands 2016 vision 6
Regional and Local frameworks for action 8

1. Introduction 16

The need for a vision and framework for local action 16
Defining our distinct housing 'character areas' 17
Our research methodology 17

2. The Region's housing market 18

Profiling the existing stock 18
Housing market 'churn' 18
Domestic emissions reduction targets 19
Targeted support for 'fuel poor' households 21
Engaging with 'fuel rich' owner occupiers 22

New-build housing trends and projections 23
Regional housing projections to 2026 25
Enforcement of the Code for Sustainable Homes 26

3. Housing market character areas 28

Urban renaissance 28
Contemporary apartment design 29
Mill and warehouse refurbishment 29
Developing CHP and Community Heating 30

Housing market renewal 31
Innovative new-build interventions 32
Council housing stock improvements 32
Pathfinder renewal areas 33
Communal solutions for terraced housing 34

Suburban heartlands 36
Local Authority strategies 37
Supporting 'pioneer' owner occupiers 38
Developing outreach and support services 39
Community-led organisations 39
The role of community 'champions' 40
Strategies for engaging with households 40
Developing new forms of financial support 41

Rural villages and market towns 42
Niche ecohousing opportunities 43
Responding to housing needs 43
Off-gas grid creates new opportunities 44

4. Bibliography and credits 45

Foreword

by Sustainability West Midlands

The Vision of Sustainability West Midlands is to achieve a more sustainable region by developing a continually improving link between sustainable development in policy and sustainability in practice and by raising awareness of Sustainable Development.

One of Sustainability West Midland's key roles is responsibility for embedding Sustainable Development in Regional Policies and Strategies, linking this to practical demonstrations of sustainability through exemplar projects including the Sustainable Housing Action Programme (SHAP).

The aim of SHAP is to demonstrate how, through the promotion of existing best practice and identification of pathways and decision points, energy efficiency and renewable energy measures can be mainstreamed into existing regional housing new build and refurbishment programmes.

Consultation with SWM's members and partners identified the use of planning and development mechanisms to drive adoption of sustainable energy best practice. This led to SWM commissioning last years SHAP report "Planning for Sustainable Homes – Meeting the Low Carbon Challenge" which provides a framework for planners at all levels. The report informed SWM's response to the West Midlands Regional Spatial Strategy (RSS) Phase Two and the Regional Economic Strategy (RES).

This work is now even more important because of the need for substantial new housing in the region, and the national target for all new housing to be zero carbon by 2016.

This new report, commissioned from URBED and Forum for the Future, sets out clear proposals to reach this target and includes proposals for refurbished as well as new housing. It is complemented by the lessons from over 20 case studies of low and zero carbon housing.

SWM is grateful, for their expert engagement and guidance, to all members of the SHAP steering group chaired by Alan Yates of Accord Housing Association. We are also pleased that Olwen Dutton has endorsed this report on behalf of the Regional Assembly. SWM looks forward to working closely with all of our partners and members through the Climate Change Panel in taking forward the West Midlands Regional Climate Change Action Plan.

George Marsh
Chair, Sustainability West Midlands

SHAP Steering Group Chairman's statement

The publication of "Building a Greener Future: Towards Zero Carbon Homes" heralded a step change in the way in which new housing is to be built in order to deliver low and zero carbon homes.

Building on the excellent report "Planning for Sustainable Homes: Meeting the Low Carbon Challenge" published by SHAP in 2007, this new report covers not only new-build housing but the more complex issue of existing housing stock.

This report provides a framework to which all regional bodies and local authorities can commit. One of it's key conclusions is that the move towards zero carbon housing represents not a threat, but an opportunity for the region in terms of both improving the quality and affordability of our housing whilst realising the economic benefits of both manufacturing and installing low carbon technologies locally.

I would like to thank both URBED and Forum for the Future for producing this report along with the members of our cross-sector SHAP Steering Group for providing the support, guidance and input into the successful completion of this important and timely piece of work.

Alan Yates
Chairman, SHAP

Preface

by the West Midlands Regional Assembly

The vision of the West Midlands Regional Climate Change Action Plan is of a sustainable, low carbon West Midlands, well adapted to the impacts of climate change and supported by a low carbon economy.

Climate Change is widely accepted to be one of the most far reaching and potentially threatening global challenges facing us today. Our housing has to be considered within climate change actions, as current indications are that housing accounts for up to 30 per cent of the Regions CO_2 emissions.

New and existing housing was identified as a key area of concern in the West Midlands Regional Climate Change Action Plan and this report, commissioned by Sustainability West Midlands for the West Midland's Sustainable Housing Action Programme (SHAP) is an important step in identifying the framework for reducing the climate change impact of housing in the Region.

At a national level, Government has committed itself to clear and ambitious targets, set out in the Climate Change Bill. To meet these targets the country needs a concerted effort from every region and across our activities the right framework and policies need to be set to ensure this will happen.

Our Minister for the Region, Liam Byrne, MP, is committed to doing all that he can to see that this Region plays its part to achieving a lower carbon economy and last December he endorsed the West Midlands Regional Climate Change Action Plan, developed by the Assembly and its partners.

Delivery of the Action Plan will be led by a Climate Change Panel of partners including Advantage West Midlands, West Midlands Regional Assembly, West Midlands Local Government Association, Government Office of the West Midlands, Environment Agency and Natural England. The Panel will be accountable to our Minister for the Region, Liam Byrne, MP.

The Action Plan sets out 30 actions that key regional partners will take over the next three years. The Regional Housing Strategy fits with the Climate Change Action Plan and includes a number of policies aimed at creating sustainable communities and in particular to ensure the existing housing stock adapts to the effects of climate change and reduces CO_2 emissions.

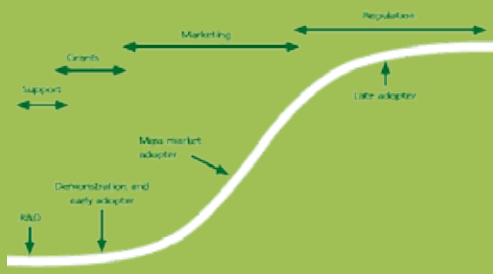
Government has set a target of all new housing being zero-carbon by 2016. However, of the homes we will inhabit in 2050, around 80% are already standing today and these have to be the main focus for carbon-reduction policies. The Regional Housing Executive is keen to ensure the maximum use of the Regional Housing Pot in addressing energy efficiency issues within the existing stock.

The drive for higher housing growth, identified in the Housing Green Paper published in 2007, to address housing shortage within the UK is another challenge facing the Region. The Regional Assembly through the Regional Housing Executive is committed to working with the Regional Climate Change Panel to ensure new housing plays its part in reducing the Region's carbon dioxide emissions.

The Assembly plan to utilise this SHAP report and to continue to work closely with Sustainability West Midlands and key regional partners to build on the existing momentum to take forward the challenge of reducing the carbon emissions from existing and new housing stock in the West Midlands.

Olwen Dutton
Chief Executive
West Midlands Regional Assembly

West Midlands 2016



Vision for a regional low carbon housing market

Looking ahead to 2016 we explore how the region successfully travelled the route to a low carbon economy, and became recognised nationally for its excellence in low carbon housing. How did it achieve momentum, target resources and drive change?

The climate in 2016

It's 2016. The UK population has just hit 63 million, and demand for housing is as high as it's ever been. The effects of climate change – which include much more variable weather patterns, and an increase in severe weather events - are permeating everyone's lives: their homes are no exception.

The pressure is on all sectors to meet their rolling reduction targets. Nationally the government has conceded that an 80% cut in CO_2 emissions will be needed by 2050, and a revised Climate Change Bill will adjust the region's 5 year target framework to require 30% cuts by 2020.

For the housing industry, climate change represents an ongoing challenge: both in terms of adaptation (with increasing numbers of buildings in flood-risk areas) and mitigation. Level 6 of the Code for Sustainable Homes has just come into force, requiring that all new-build homes are zero carbon. The Climate Change Bill requires that domestic emissions are reduced 26% by 2020.

So how is the West Midlands doing.....?

The West Midlands is successfully travelling the route to a low carbon economy, and is recognised nationally for its excellence in low and zero carbon housing. The region has become the UK's exemplar in new build technology and retrofitting through an early investment in time and resources, and by collective commitment at all decision-making levels.

In 2007 housing accounted for 30% of the West Midlands' CO_2 emissions; in 2016 the figure is 23%. This also represents an absolute decrease for the region, as overall emissions are decreasing as well, on target for a 30% reduction from 1990 levels by 2020.

Since 2012, the region has consistently met its regionally defined targets for refurbishment of 20,000 homes per year, with the intention that this should rise to 140,000 per year by 2020. Last year, in 2015, the West Midlands was recognised as the first region to have successfully removed all non-heritage homes with energy performance ratings of band E from its housing stock; (this followed the previous removal of bands G & F).

A new build rate of around 20,000 homes per annum has also been key. All new properties have been built to at least the Code for Sustainable Homes level 3, with the region also having demonstrated how to achieve Code level 6 on a number of large sites with new sustainable energy infrastructure. This delivery followed a period of capacity building with local authority development control and building control officers.

So how did the region achieve this momentum….?

One vital aspect of the regional approach has been to carry out pilot refurbishments for every distinctive house and apartment type. These pilot schemes were developed between 2008 and 2011, and in each Local Authority area. The impetus of the programme was given a kick start though the the Regional Climate Change Action Plan which formed one of the key priorities of the Regional Minister.

Advantage West Midlands had the responsibility for developing the Regional Integrated Strategy, and a consortium of public and private bodies at the regional level have played a key role by providing financial support for both private and non-profit enterprises to coordinate retro-fitting services across contractors.

These models are now privately-financed and have created a regional heritage of innovation and facilitation - defining the West Midlands as the place 'that makes change happen'.

There are an ever-growing number of installation specialists in the region: over 15,000 people now have the skills and capability to deliver. Of the roughly 80,000 houses per year that are now being retro-fitted and the £10K average spend per home, nearly £1 billion is being circulated directly back into the regional economy every year.

The skills involved in these processes are in high demand and having secured first-mover advantage, the West Midlands region is a net exporter of retro-fitting services to the rest of the UK. One example of its leadership has been in developing model 'roofspace' agreements between households and utilities, so that utilities companies can lease the roofspace, turning the roofs of whole neighbourhoods into solar heat and power stations.

…and how did it target resources to drive the changes….?

The 100,000 owner occupied homes that change hands each year in the region have been the main target for sustained outreach programmes. The private rental sector has also been targeted by Local Authorities, which have included the improvement of properties' energy rating in order to move homes beyond the basic minimum of the 2010 'Decency Standards' for homes.

Local Authorities have co-ordinated high quality training within their communities to enable these programmes, and have also worked with estate agents, surveyors and mortgage providers to reinforce the use of the new Energy Performance Certificates.

Novel new forms of outreach, based on lessons from countries such as Canada, have been used – with a successful focus on community-led home refurbishment enterprises that have provide trusted advice and translate awareness into action.

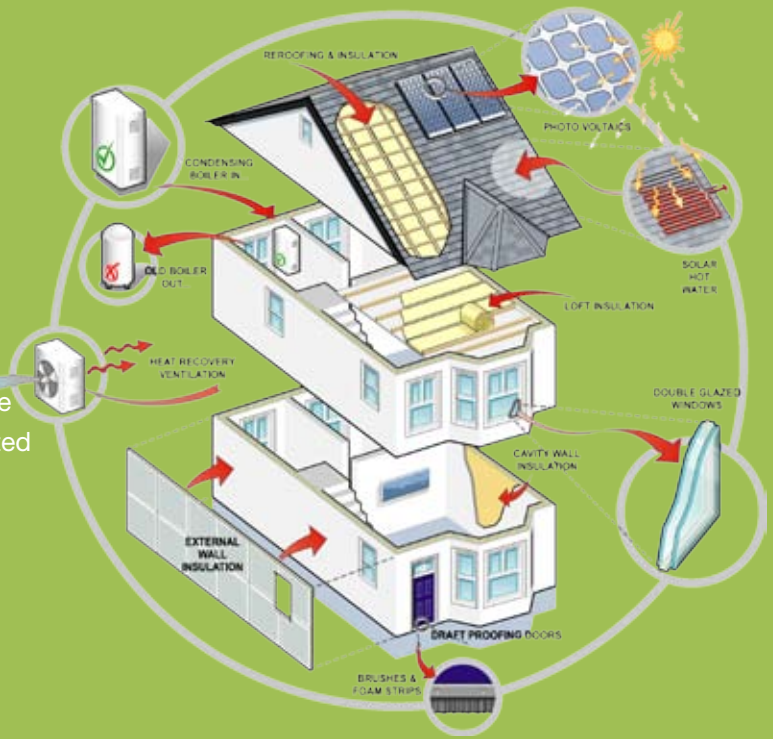
Engagement with these professional groups has also meant that the understanding of the long-term advantages of a low-carbon home have filtered through to home-owners. And in turn,

public demand for retrofitting has increased, with mortgage products such as equity release offering a model for the provision of long term, low cost loans to owner-occupiers.

…and what were the economic benefits for the region?

The region's manufacturing and engineering base has benefitted from the increased demand for retrofitting appliances, technologies and materials. The industries aligned with the West Midlands' existing skills base (for example metal fabrication) have of course been supported and have proved particularly successful.

Many of these low and zero-carbon technologies have also afforded knock-on opportunities for local supply chains: for example, biomass boilers securing links with renewable fuel suppliers in the region. The West Midlands' prominence has also attracted EU manufacturers to set up in the region and as a result technology transfer has substantially increased. West Midlands-based companies have consequently licensed winning EU technologies, further reinforcing the region's standing as a leader in the field of low and zero carbon housing.



Credit: ESD/Generation Homes

Regional framework for action

Progress towards a regional low carbon housing market

In this section of the key findings and recommendations from our research and stakeholder engagement we setout the implications for the region, considering the scale of the progress required, and the role of regional housing strategies and policy makers.

The scale of progress required

The national climate change strategy sets out a target of reducing CO_2 emissions 60% by 2050, although there is growing scientific consensus scientists suggest that this should be revised upward to 80%.

The proposed Climate Change Bill will require reductions from the domestic sector of between 26% and 32% by 2020 based on rolling 5 year plans. The Regional Climate Change Action Plan sets out a range of priority actions to provide a first step in a regional programme to address the challenge of climate change.

The West Midlands has a population of 5.3 million people and approximately 2.3 million homes. Energy use in housing accounts for 30% of the West Midlands CO_2 emissions. Space heating is the major source of domestic CO_2 accounting for over 50% of a typical households annual emissions, followed by electricity (30%) and hot water (14%). Although the energy efficiency of the housing stock is improving year on year, in the short term this is likely to be cancelled out by increased comfort levels and growth in consumer electrical goods.

The region's housing market is dominated by owner occupation, which accounts for over 70% of the housing stock. Registered Social Landlords and Councils each account for 10% of the housing stock, with private rental accounting for the remaining 9%.

The majority of the housing stock takes the form of houses as either detached (23%), semi-detached (38%) or terraced properties (28%). Apartments account for 10% of the stock, but this proportion is rising with 46% of all new-build completions in 2006 consisting of apartments.

The majority of homes within the West Midlands fall within Energy Performance Certificate bands E, F or G. The average SAP rating of a West Midland's home is 48 and nearly 60% of the housing stock dates from before the Building Regulations were first introduced in 1965 to improve energy efficiency standards. 829,000, or 36%, of the regional housing stock is currently estimated to fall short of decency standards. Of these a disproportionate 75%, 620,000 homes, are in the private sector.

Whilst the Decent Homes Standard has created a focus on overall home improvements, it is generally agreed that it does not currently provide a strong enough focus on energy efficiency, requiring stronger alignment with climate change objectives.

Policies and programmes designed to raise the energy efficiency of the housing stock, including the Home Energy Conservation Act and Warm Front, have made some progress, mainly working with low income and vulnerable households.

HECA returns for West Midlands local authorities reported reductions in domestic energy use of between 14% and 31% during the period 1996-2005. However, the quality of this data may be open to question due to a lack of consistent baseline information and wide variation in how progress is reported.

The Regional Energy Strategy sets out the scale of works required on the existing housing stock in order to make progress. However, with the demise of Energy West Midlands the region is currently evaluating the best means of monitoring progress against the targets set out in this strategy. This also seems to have left a gap in the ownership of detailed implementation planning.

To establish the momentum required to meet the Regional Energy Strategy targets, and those likely to be required under the Climate Change Bill, the region will need to achieve a target annual refurbishment rate of at least 20,000 properties per annum by 2011 (1% replacement rate), rising to at least 80,000 properties per annum by 2016 (3.5% replacement rate).

This will need to be matched by a minimum demolition and new-build replacement rate of 4,000 properties per annum built to Code for Sustainable Homes level 3 and higher as set out in the draft Regional Spatial Strategy Revision.

Based on evidence from local authority stock condition surveys and '40% house' pioneers the average cost of upgrading an existing home to a 'basic' low carbon standard is likely to be £15,000 - £25,000 (at 2008 prices).

This is based on a combination of the fabric improvements setout in the Regional Energy Strategy, and at least one low carbon energy technology per house, with the aim of raising properties into EPC band C. It also assumes existing supply chains, refurbishing homes one at a time and conducting works as stand alone projects and not in addition to existing improvement plans.

Key Recommendations

- Greater integration of action and momentum is needed following on from the Regional Ministers prioritisation of climate change in order to begin to reduce the carbon emissions from the existing housing stock, and this should be linked to the proposed 5 year plans under the Climate Change Bill.
- Effective regional monitoring in line with the Regional Climate Change Action Plan and co-ordination is needed, and action will need to move beyond the current focus on vulnerable households and into the mainstream owner occupied housing market.
- The West Midlands region should set target replacement and refurbishment rates in each sub-regional Housing Market Area for for the existing housing stock, with a focus on property built prior to 1965 in order to prioritise resources, and with an eventual focus on all property built prior to 1990 which will require improvement to a 'basic' standard of of Energy Performance Certificate rating band C by 2050.
- The refurbishment rate to this 'basic' standard should match the RSS proposed new-build rate of around 20,000 per annum by 2011, rising to 80,000 per annum by 2016, and increasing the momentum through to 2026 in order to tackle the majority of the housing stock.
- Targets should be set in each sub-regional Housing Market Area for the progressive removal of homes from bands G, F and E, which will require the significant improvement of at least 829,000 homes. Support in each area should be developed in conjunction with the Energy Savings Trust's proposed new intitiative.'Fitness' and 'Decency' standards for homes should be aligned more closely with climate change objectives in order to require the improvement of properties, particularly in the private rental sector where compulsory landlord accredititation should be introduced.
- These targets should be enacted through model local frameworks for action (see below), with the full support of regional bodies and sub-regional Housing Market Area Partnerships, and with a specific role for the Climate Change Panel, (for example through Advantage West Midlands providing business support). These frameworks should be linked to Local Area Agreements on climate change.
- Historical precedents for widespread, systematic change should be examined in order to gain insight. These include the switchover from town gas to natural gas, and implementation of the Clean Air Act and Smoke Control Zones.

The role of regional housing strategies and policy makers

Regional housing policy will need to provide a stronger focus on raising the standard of the existing housing stock if the West Midlands is to respond effectively to the targets proposed under the Climate Change Bill.

Given its remit to support the planning for housing provision to 2026 in the RSS Revision, the Regional Housing Strategy has the potential to provide a focus by establishing a regional framework for action and input into the Regional Climate Change Action Plan. Delivery 'on the ground' will ultimately be the responsibility of Local Authorities, working together through sub-regional Housing Market Area Partnerships to establish targets and share resources and best practice.

This role should be complemented and nurtured by model local frameworks for action, which could be linked to Local Area Agreements (LAA's), and across sub-regional Housing Market Areas by Multi-Area Agreements (MAA's). Proposals and policy relating to new-build performance targets should be incorporated into Core Strategies and Local Development Documents.

The German housing modernisation programme provides an example of how large-scale progress can be co-ordinated and supported, driven by climate change policies but also the direct benefits to the economy and people's quality of life (see next point). The programme achieved a refurbishment rate of 60,000 properties per annum between 2000 and 2005, with delivery largely devolved down to a regional level, and this is to be stepped up in-line with international climate change commitments.

The evidence from pioneers such as Germany is that capacity building of the skilled trades and the development of supply chains will be needed in order to support large-scale refurbishment of the housing stock, and delivery of the Code for Sustainable Homes. This could generate economic benefits for the region in the form of new skills development and economic activity.

In order to realise these benefits co-ordination will be needed at a regional and sub-regional level from Advantage West Midlands and the Housing Market Area Partnerships in order to assist Local Authorities, housebuilders and communities in building up networks of trusted suppliers and installers.

There may also be the opportunity to attract EU manufacturers, or even for West Midlands firms to license the manufacture of 'winning' technologies that will be required to meet domestic CO_2 targets. However, this could only be achieved if the region was able to demonstrate that it was committed to the building of local markets for low carbon building and energy technologies.

Delivering 'future' standards of 'zero carbon heating' (Code level 5) and 'net zero carbon' homes (Code level 6) for a projected 20,000 new-build homes per annum from 2016 will require substantial investment in energy supply technologies and infrastructure. The provision of low and zero carbon infrastructure for new housing sites will therefore be vital in meeting the 2016 zero carbon homes target.

The West Midlands RSS Phase Two Revision Draft Implementation Plan recognises the importance of infrastructure in delivering the higher numbers of housing completions projected to 2026. For larger sites with more than 200 completions there could be scope for Advantage West Midlands with partners to work with Local Authorities, the new Homes and Communities Agency and housebuilders to establish Energy Service Companies (ESCos) to deliver technologies such as decentralised energy in the form of community heating and wind power.

It must be recognised, however, that 60% of completions are on developments of less than 200 properties, and 30% of completions are on developments of less than 10 properties. These smaller sites may require stronger regulation and different models, such as roofspace agreements that reduce the capital cost for housebuilders and homeowners by allowing an ESCo to make use of their roof for solar heat and power.

Key Recommendations

- A regional framework for action is required, with actions forming part of the Regional Climate Change Action Plan and the West Midland's Regional Housing Strategy.
- Action should be directed through the sub-regional Housing Market Area Partnerships, potentially making use of Multi Area Agreements between Local Authorities, and with a focus on the cascading down to local level of targets, complemented by guidance and support for Local Authorities to implement model local frameworks for action (see recommendations below).
- The Climate Change Panel, Regional Assembly, Housing Market Area Partnerships, Advantage West Midlands, and partner Local Authorities should co-ordinate the delivery of low and zero carbon energy supply infrastructure for larger development sites and in Settlements of Significant Development
- The approach should be tailored to the size of each development, and the nature of the housing in each character area. Sites should not be seen in isolation and should form part of wider energy planning for districts and neighbourhoods in terms of planning for decentralised energy and delivery of RSS draft policy.
- Partnerships should be established with utilities, in order to access money under the new Carbon Emissions Reduction Target (CERT) programme, and specialist Energy Service Companies (ESCos).
- New ESCos should be established in order to deliver key technologies such as community heating that may not be attractive to the private sector, and to develop new models such as roofspace agreements for solar technologies.
- The Climate Change Panel, Local Authorities and regeneration bodies such as the Housing Market Renewal Pathfinders should work together to stimulate the demand for domestic low carbon technologies and services.
- A competition could be initiated by Housing Market Area Partnerships, Local Authority and Registered Social Landlord (RSL) partners, to encourage consortiums of contractors to bid for district and neighbourhood-scale projects.

Local framework for action

A model local framework for transforming the existing housing stock

In this section of the key findings and recommendations from our research and stakeholder engagement we setout the key elements that could form part of a model local framework for action, with a specific focus on improving the existing housing stock.

Local Authorities providing leadership and co-ordination

Local Authorities have an important role to play in local communities by demonstrating leadership on climate change – as highlighted by the Local Government White Paper and Local Area Agreement climate change indicators. This role will become more important with enactment of the Climate Change Bill and the need for more progress on the ground.

Co-ordination of action will be required at a local level if progress is to be made, particularly in tackling the existing housing stock, to enforce and align fitness standards with climate change objectives and in seeking to go beyond the Decent Homes standard.

Local Authorities, supported by sub-regional Housing Market Area Partnerships and County Councils, and working through Sustainable Community Plans are in the best position to play this role, particularly in engaging the community outreach that will be needed to unlock the owner occupied housing market.

The 'wellbeing' powers conveyed to Local Authorities by the Local Government Act 2000 provide a wide remit to co-ordinate action and, where necessary, to intervene in local areas, and to participate in new enterprises such as ESCos.

Local Authorities also have statutory powers to enforce fitness standards for homes, and these could be aligned more closely with climate change objectives in order to require the improvement of properties – particularly in the private rental sector where landlord accreditation schemes are likely to become increasingly important.

The more familiar statutory roles of Building Control and Development Control will both play a key role in the local delivery of the Code for Sustainable Homes as it converges with Building Regulations, as well as the new requirements setout in the supplement to PPS1 on Planning and Climate Change. These could include on-site renewables and CO_2 reduction targets to stimulate greater energy efficiency and sustainable energy generation.

Local Authorities are now expected to plan for the provision of low carbon energy in each district and neighbourhood. Training and capacity building will be needed to ensure that Officers and committee members have the knowledge and expertise to respond to this new remit. This should be complemented for the existing housing stock by the knowledge and expertise of local Energy Advice Centres and other equivalent bodies.

Careful engagement is needed with heritage bodies such as English Heritage and regional heritage bodies in order to develop solutions where restrictions may apply to the external works that could be carried out. Local Authorities could take the lead in brokering this dialogue, and in negotiating Permitted Development Rights.

Building blocks

- Local Authorities should provide co-ordination and outreach, forming a key theme of their Sustainable Community Plans;
- Support and sharing of best practice between Local Authorities at a sub-regional level;

- Re-inforcement of climate change objectives through the use of 'wellbeing' and statutory enforcement powers, and the use of landlord accreditation;
- Increasing remit for Building and Development Control to plan and enforce;
- Training and capacity building to ensure that Building and Planning Officers and relevant Committees can respond to this remit;
- Careful engagement with heritage bodies to identify solutions.

Establishing a strong evidence base

High quality, meaningful survey data is needed in order to form the starting point and baseline for local action. This could take a number of different forms, from sample surveys of house and apartment types, to authority-wide GIS data using tools such as thermal imaging. New systems are also needed to feed details of actual improvements to homes, and low carbon technology installations, into the national HEED database.

The new supplement to PPS1 on Planning and Climate Change highlights the importance of taking a strategic approach to low carbon energy infrastructure. It highlights the need to consider how new housing sites will be served, but these should not be seen in isolation from neighbouring heat loads and potential renewable energy resources.

Building blocks

- High quality meaningful data as the baseline for local action;
- Sample surveys and area-wider mapping;
- New systems needed for recording;
- improvements works that take place;
- Strategic approach to energy infrastructure.

Developing pilot house-type 'demonstrators'

The diversity of different house and apartment types in each West Midlands housing character area means that examples are needed of how each can be improved. Pilot refurbishments for every distinctive house and apartment type should be developed in each Local Authority area, drawing up best practice from the Energy Savings Trust, as well as the emerging range of support bodies such as the Sustainable Energy Academy. This will enable a knowledge base of the 'kit of parts' and the installers that will be needed for each house and apartment types.

Social landlords should be engaged in carrying outdemonstrator refurbishment projects that have the potential to achieve significant economies of scale. These should seek to go beyond the current Decent Homes standard in order to deliver a band C performance. This process should be used to develop the contractor and installer expertise, which could then be used to benefit the wider owner occupier market.

Building blocks

- Carry out pilot refurbishments for every distinct house and apartment type;
- Build a knowledge base of the 'kit of parts' and installers for each typology;
- Adopt an 'open-source' approach to the learning from projects;
- Engage social landlords in larger scale demonstrator projects;
- Use contractor and installer relationships to target owner occupied market.

Supporting community engagement and outreach

Novel approaches to outreach are needed in order to increase the initial uptake of home improvement works and low carbon energy technologies by households.

A key opportunity to undertake improvement works is when homes change hands. Up to 100,000 properties change hands each year in the region, and these should be a major target for outreach programmes, potentially working with estate agents, surveyors and mortgage providers to reinforce the use of the new Energy Performance Certificates.

Utilities should be engaged in the development of local and sub-regional energy service delivery models. These would seek to shift the emphasis from the sale of energy onto the delivery of health and comfort for households, in order to incentivise the improvement of homes, efficient electricity use and CO_2 reduction. This could be linked to the expansion and promotion of Local Authority agreements with insulation companies and energy providers to offer discounted council tax bills or alternative rebates on local taxation.

Utilities could also be encouraged to carry out improvement surveys for vulnerable households, which would be triggered when a household is put onto card pre-payment meters. For the majority of households smart metering should be installed in order to provide people with information and influence behaviour.

Local authorities and non-profit public and private sector organisations have an important role to play in providing access to intelligent and impartial information on technologies and installers. Their role should be supported by work at a regional level to reinforce quality standards and support supply chain development.

The establishment of community-led social enterprises and co-operatives to provide trusted energy efficiency advice, stimulate local demand and co-ordinate installation work is a model that has worked in Canada and the USA have potential in the West Midlands. Their key benefit is that they can help unlock local potential for action by engaging at a grass roots level, then providing a clear route for people to take action, and by bringing together households creating significant economies of scale.

Community representatives and 'champions' are likely to be in a better position to influence people in their local community. They should therefore be given access to high quality training through organisations such as the new Energy Savings Trust Energy Efficient Advice Centre's (ESTAC's) so that they can then provide the outreach within their local communities.

The process for identifying champions will vary greatly from area to area, and Local Authorities may not always be in the best position to do this. Community-led bodies such as Development Trusts may help to identify, support and provide legitimacy and trust to community champions.

Building blocks

- Engagement of households at the point properties change hands;
- Engagement with estate agents, surveyors and mortgage providers;
- Engagement of utilities to develop energy service delivery models;
- Work with utilities to provide improvements for vulnerable households;
- Community and non-profit enterprises to provide advice and services;
- Training and empowerment of community champions to provide outreach.

Novel financial mechanisms

Low cost finance is required that households can easily access, through a clear route linked to their property, such as through their mortgage provider, or via local advice or outreach programmes. Financial products such as the Kickstart loans and the Co-operative Bank's 'Energy efficient advance' provide a model for the provision of debt-based financial support to the owner occupier housing stock.

CERT money provided by utilities could also be used to support top-up grants and revolving loan funds for home improvements and low carbon energy technologies.

A model roofspace agreement should also be developed that can provide a framework for micro-generation to be financed, installed and maintained by a utility or ESCo, covering both new-build and existing homes.

A financial model for the delivery of 'enveloping' works is needed for whole terraced streets is required, incorporating a mechanism for homeowners, landlords and the public sector to share the value of any uplift in the local property market from improvements.

The VAT disincentive to comprehensive refurbishment projects for existing terraced housing could be overcome by transferring low value housing to social landlords on repairing leases.

Building blocks

- Provision of low cost finance and equity release for owner occupiers;
- Harnessing of CERT money to support revolving loans and top-up grants;
- Development of roofspace agreements to finance micro-generation;
- Development of financial model for terraced street 'enveloping' works.

1.Introduction

The need for a vision and framework for local action

A partial review of the West Midlands Regional Spatial Strategy (RSS) is currently underway. This process has emphasised the growing gap between actual regional CO_2 emissions and national government targets, with domestic emissions accounting for a significant proportion.

A partial review of the West Midlands Regional Spatial Strategy (RSS) is currently underway. This process has emphasised the growing gap between actual regional CO_2 emissions and national government targets, with domestic emissions accounting for a significant proportion of these emissions.

The regions total annual CO_2 emissions in 2002 were estimated to be 41.6 M tonnes of which 30% were accounted for by domestic energy use. The 51,330 GWh hours of energy used by homes within the West Midlands generated 12,6 M tonnes CO_2.. The Regional Energy Strategy proposed targets to reduce domestic emissions by 2.4 Mtonnes (19%) by 2010, and then 3.7 Mt (29%) by 2020 from a 2002 starting point.

This report seeks to respond to this gap by building on the Regional Climate Change Action Plan to reduce the carbon emissions of the West Midland regions housing stock in line with national and regional commitments. It sets out a series of recommendations for the region, making the link with the regional housing policy framework and the Regional Climate Change Action Plan (see below), with a focus on two key areas for action:

- New-build housing: The need to support the housebuilding industry as it moves towards compliance with the new Code for Sustainable Homes, and as Regional and Local Government moves towards a stronger focus on planning for low carbon development in response to the new supplement to PPS1 on Planning and Climate Change and the draft RSS Revision;
- Existing housing stock: The need to raise the standard of the existing housing stock in order to deliver domestic emissions reductions in-line with the Regional Climate Change Action Plan, regional and local climate change strategies and the emerging CO_2 reduction framework being promoted through the proposed Climate Change Bill, which will seek to cascade five year targets down to a regional and local level.

We have sought to build on the approach promoted by the West Midlands Regional Energy Strategy, and to explore the role of different stakeholders at a regional and local level.

Regional housing policy framework

The regional policy and planning framework for housing is defined by a number of key documents, in descending order of material consideration:

- Regional Spatial Strategy (RSS) - Which sets the overall spatial planning policy framework, including an overarching framework for 'Communities of the future', specific policies for urban and rural areas and climate change mitigation policies;
- Regional Housing Strategy – Which takes further the regional housing numbers in the RSS down to sub-regional level to deliver mixed and balanced communities;
- West Midlands Economic Strategy - Which seeks to realise the potential regeneration benefits of new housing development as well as growth in 'environmental industries' and related building technologies to achieve carbon reductions.
- Regional Climate Change Action Plan – Which sets out the priority actions to be delivered by the Regional Climate Change Panel and monitored by the Regional Minister.

In addition the Regional Sustainable Development Framework and the Regional Energy Strategy set out policies and targets to be incorporated into the RSS, including reference to specific measures and technologies.

Defining distinct housing 'character areas'

In order to give the report further relevance at a local level we have focussed our research and thinking around four physical housing 'character areas' broadly aligning with the housing policy objectives highlighted in the West Midlands RSS, and making the link with the Regional Housing Strategy:

- Urban renaissance: Stemming outward migration from the Major Urban Areas in order to secure their economic future;
- Housing market renewal: Achieving Housing Market Renewal in Pathfinder areas through selective demolition and new-build;
- Suburban heartlands: Protecting and enhancing the quality of housing in existing suburban areas;
- Rural towns and villages: Responding to specific housing needs on smaller sites in rural areas.

This report, and the actions and recommendations it sets out, are complemented by a separate report for the Sustainable Housing Action Programme which reviews the lessons from over 20 case studies of low and zero carbon housing that might typically be found in each of these Character Areas, including examples of both new-build and refurbishment.

Our research methodology

We have brought together the latest thinking from a number of different sources, including:

- Evidence base: We have reviewed data relating to the West Midlands housing stock, industry data relating to the housing market and housebuilding industry, the housing numbers emerging from Partial Review of the Regional Spatial Strategy.
- Literature review: We have reviewed a range of literature including a number of recent major reports by, amongst others, the University of Oxford's Environmental Change Institute and the Energy Saving Trust.
- Case studies: We investigated case studies of over 20 low and zero carbon housing projects, examining the lessons from each project and how their fundamental approach could be replicated on a larger scale.
- Stakeholder consultation: We consulted with a range of practitioners and stakeholders in the field, through telephone interviews and two themed roundtable workshops.

We have used this research to formulate frameworks relating planning, building control, housing strategy, community outreach and supply chain.

Case studies of low and zero carbon housing

Accompanying this report are the lessons from over 20 case studies of low and zero carbon housing. The case studies relate to the different forms of housing found in each of our four 'character areas'.

They explore the fundamental building and energy technologies required to respond to the Code for Sustainable Homes, and to improve the existing housing stock, against four benchmarks:

- Basic' refurbished home: Housing built prior to the formal regulation of fuel and power under the Building Act of 1984 that has been brought up to 1995 Building Regulations standards.
- 'Current' new-build home: Housing built to the current 2006 Part L of the Building Regulations which requires a 20% reduction in the Target Emission Rate (TER).

- 'Advanced' new-build home: Homes that reduce emissions beyond the current Building Regulations, equivalent to Code for Sustainable Homes Level 3 and 4 which require a 25% and 44% reductions on the Building Regulations 2006 TER.
- 'Future' new-build home: Homes that achieve net zero carbon for all energy use regulated under 2006 Part L - space heating, hot water and fixed lighting - with the potential to move towards net zero carbon for all energy use.

2.The Region's housing market

New-build and existing housing trends and initiatives

In this section we seek to understand and characterise the nature of the housing market in the region. We begin by exploring the region's existing housing stock, drawing on national and regional data to understand how it varies by form, value, residency time and tenure. We then review the pipeline of new-build housing, putting it in the context of:

- The latest proposed RSS projections;
- The type and size of housebuilders bringing forward new stock;
- The numbers of units that will need to respond to the Code for Sustainable Homes.

This insight will then be used in Section 3 to describe the type and scale of interventions that will be required under each of our four 'character areas'.

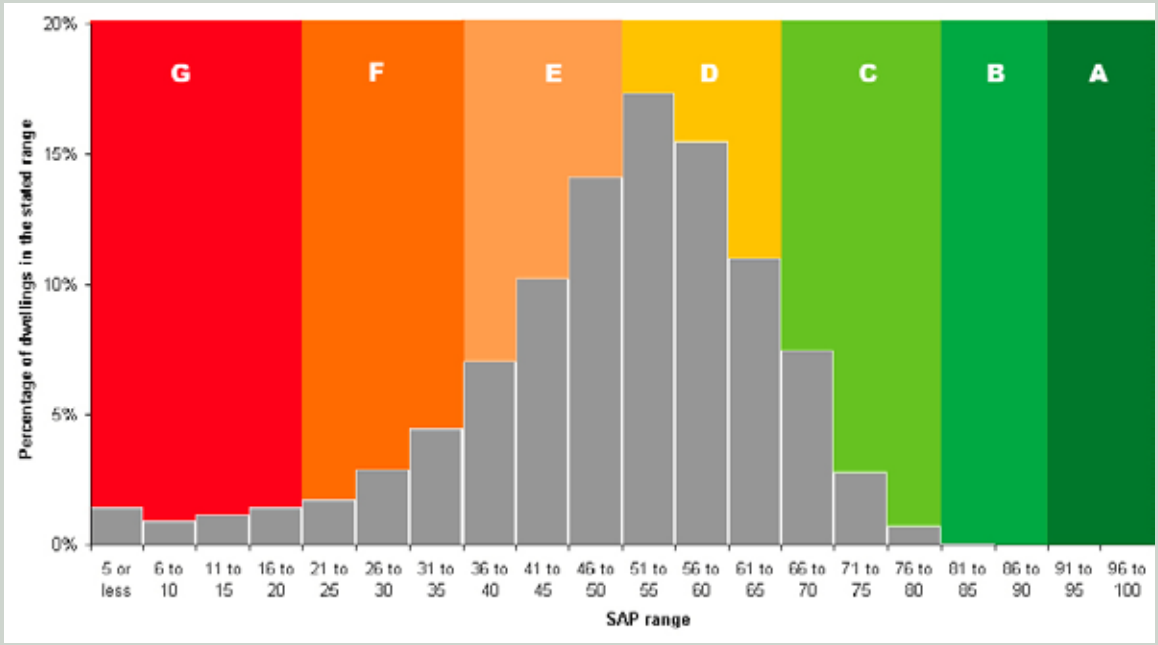
Profiling the existing housing stock

The West Midlands has a population of 5.3 million people and approximately 2.3 million homes (2001 Census). The regions housing stock varies considerably in form and tenure – reflecting the contrast between the Major Urban Areas of Birmingham, the Black Country, Coventry and North Staffordshire, and the rural shires of Shropshire, Herefordshire and Worcestershire, accounting for 80% of its area and 20% of its population.

The housing market in the region is dominated by owner occupation, accounting for 72% of the stock. RSL's and Councils each account for 10% of the housing stock, with private rental accounting for the remaining 9%. The majority of the housing stock takes the form of houses – in the form of detached (23%), semi-detached (38%) and terraced properties (28%).

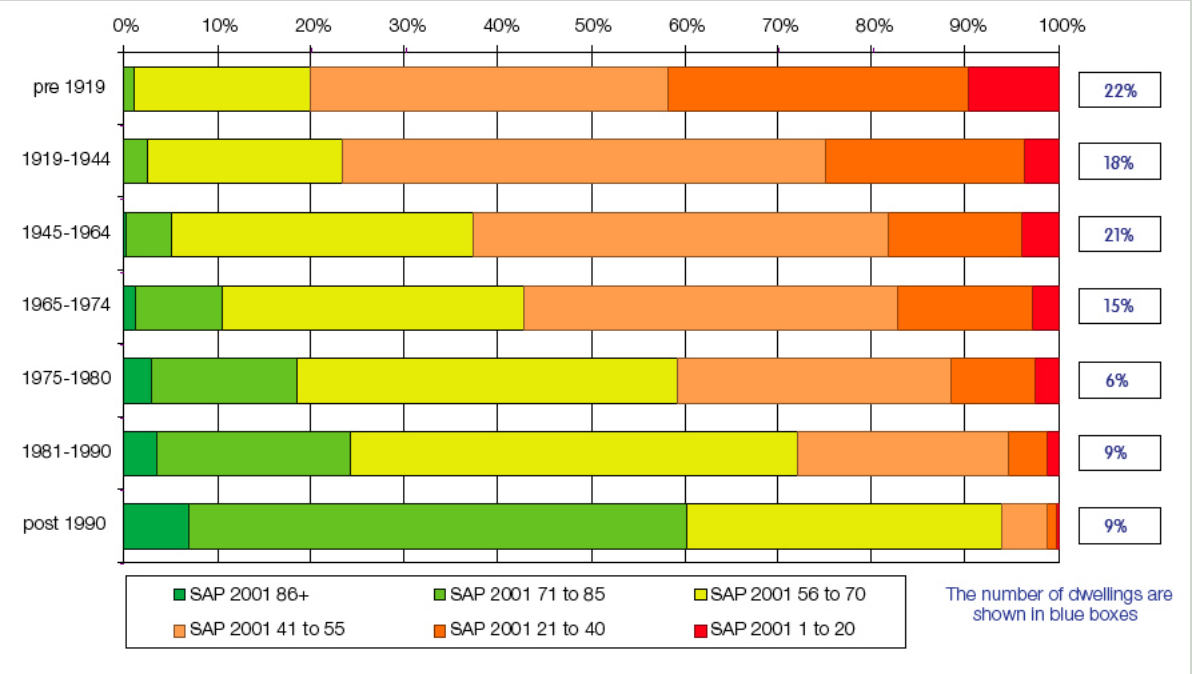
Flats account for around 10% of all properties although, as we go on to discuss in Section 3.0, the majority of new-build completions in urban areas are now flats which will progressively begin to influence the mix of housing typologies – although there are signs that this trend may level out.

Indicative Energy Performance Certificate profile of the UK housing stock



Source: University of Oxford (2007) Home Truths, Environmental Change Institute

SAP performance and age profile of the UK housing stock



Source: DCLG (2006) Review of the sustainability of existing buildings

The average home in the West Midlands has a SAP rating for its building fabric of 48.8 with around 829,000 falling short of the Decent Homes Standard – the majority of which (620,000) are in the private rental and owner occupied sector. A SAP rating of around 50 creates a demand for space heating of around 140 kWh/m^2 which, typically, might account for over 50% of a households CO_2 emissions.

The age of the stock will tend to dictate its energy efficiency, with 35% dating from before 1945, 24% in the post-war period up until 1964, and 34% in the period up until 1990 after which Building Regulations became significantly tighter, with revisions of Part L 'Conservation of fuel and power' in 1995, 2001 and 2006.

In fact, around 60% of the region's housing stock pre-dates any form of Building Regulation of fuel and power, which was first introduced in 1965. Research has also shown that more affluent households tend to occupy the oldest housing stock with the largest floor areas.

Black Country Housing Group's project 'Changing rooms that don't cost the earth' looked at a range of typical West Midlands house types. And is one of a number of projects, also including Bournville Village Trust's 'ecorenovation' house and Staffordshire Housing Associations 'ecoterrace', that have sought to show how many existing older dwellings have the potential to be modernised to reduce carbon emissions, whilst still retaining local character.

Housing market 'churn'

The residence time in a property may in the future become a key variable influencing the willingness of owner occupiers and landlords to invest in home improvements. Data is only currently available for England as a whole, however, it is useful as an indicators of typical residence patterns by tenure.

Housing market statistics for the region suggest that annual private sales stand at around 100,000 per annum (2006). Based on the West Midland's owner occupied stock of approximately 1.7 million this suggests a market 'churn' of around 6% per annum.

Although the long residence time of people in their homes of 15 years for the average private dwelling suggest that this may represent a smaller proportion of the housing stock that changes hands more frequently by virtue of its location, desirability and/or position on the housing 'ladder'.

Average length of household residence for England's housing stock

Residence time in dwelling (years)	Tenure (%) Owner	Social sector	Renter	Average (%)
<1	5	9	38	10
1-3	12	16	31	15
3-5	10	13	9	11
5-10	19	21	9	18
10-20	22	20	5	20
20-40	24	16	4	20
40+	8	5	2	7
Mean (years)	15.9	12.2	4.9	13.9
Median (years)	11.8	7.7	1.6	9.0
Total number of properties (m)	14.5	3.9	2.5	20.9
Percentage of the housing stock	69	19	12	

Source: University of Oxford (2007) Home Truths, Environmental Change Institute

Domestic emissions reduction strategies

The West Midlands Energy Strategy provides an overall set of targets for CO_2 emissions reductions against 2002 levels, and includes targets for domestic emissions reductions for the existing housing stock, together with some basic assumptions on how they could be achieved.

The most significant opportunity is the reduction of space heating demand – primarily through improvements in building fabric performance and heating systems. Appliances and lighting are also identified as key priorities, requiring less direct intervention to improve properties, and having a higher proportionate impact on emissions because they reduce electricity demand.

Implementation of all measures stated in the Energy Strategy would result in a 50% reduction in emissions from domestic energy use. These measures would also need to be matched by potential reductions from, depending on the type of housing, either Combined Heat and Power (CHP) and Community Heating, or building integrated micro-generation technologies.

The Energy Strategy sets out an overall reduction for domestic CO_2 emissions of 19% by 2010 and 29% by 2020, based on 2006 levels. An assumption has been made that this will require implementation of a basic set of efficient measures for 35% of the stock by 2010 rising to 50% by 2020. This level of intervention would require an unprecedented level of works on the housing stock, with nearly 1 million properties requiring works to upgrade them to minimum performance rating of B and C.

The German housing refurbishment programme provides a potential model for how large-scale housing modernisation can be co-ordinated and supported. The German programme has been driven by climate change policies, but also the direct benefits to the economy and people's quality of life (see case study). Of particular relevance to the West Midlands is the devolution of delivery in Germany down to a regional and city level.

The German programme has been complemented by support for micro-generation and low carbon heating systems, with generous export tariffs for renewable electricity making micro-generation much more viable than in the UK where export tariffs are typically the same as wholesale electricity prices.

National support for the local targeting of older properties, with a specific focus on bands F and G, and including easier access to low cost finance, is currently being proposed by the Energy Savings Trust to be delivered through Energy Efficiency Advice Centre (EEAC) network.

Case study: Building modernisation programme 2020, Germany

The German government adopted the new 'Integrated energy and climate change programme' in 2007 which seeks to put the country on track to deliver a 40% reduction in CO_2 by 2020.

Recognising the importance of improving the energy efficiency of the existing housing stock, it includes a comprehensive support 'building modernisation programme'. A key driver has been the economic benefits with every € 1 billion invested estimated as safeguarding or creating about 26,000 jobs.

Home owners are provided with support in the form of a grant or low-interest loan. The government is providing 1.4 billion Euro of funding for 2006-2009 some of which is used to support loans provided by the KFW Bank. Between 2000 and 2005 approximately 300,000 homes were refurbished, and a further 400,000 homes have been refurbished during for 2006 and 2007.

A market incentive programme also provides support for home owners who would like to install renewable energy technologies, with grants or low interest loans available for heating technologies such as biomass boilers and solar thermal panels. Solar photovoltaics are supported by generous tariffs for households selling excess electricity together with low interest loans.

Source: Bundestag (2007) Integrated energy and climate programme

Targeted support for 'fuel poor' households

A range of national and regional programmes have sought to target vulnerable sectors of the housing market. The government's Warm Front programme has targeted the 'fuel poor', allocating subsidy for direct use by Local Authorities. This has largely been used to improve Council housing stock, as well as providing grants to vulnerable households through local Energy Advice Centres (EEAC's).

The Decent Homes Standard has sought to drive improvements and investment in properties under the control of Councils and Registered Social Landlords. Regional programmes such as the West Midlands Kick Start Partnership have successfully begun to provide low cost finance and equity release products for owner occupier households to make home improvements.

Proposed package of regional domestic energy efficiency measures

	Saving/dwelling			
	kWh/yr	kg CO_2/yr	,000 WM dwellings	WM kt CO_2 potential
Loft insulation (currently below standard)	1,011	257	1,700	437
Cavity wall insulation	4,239	1077	783	843
Solid wall insulation	3,675	934	955	892
Double glazing	1,847	469	661	310
Draught proofing	486	124	1,516	187
Hot water cylinder insulation (currently below standard)	676	131	452	59
Condensing boilers	4,569	887	1,408	1,248
Improved boiler controls	1,672	324	226	73
Energy efficient lighting	272	250	2,178	543
Energy efficient appliances	133	122	15,167	1,853
Total				6,447

Source: Energy West Midlands (2004) West Midlands Regional Energy Strategy

Case study: Cornwall Community Strategy

In 2004 Cornwall launched the first community-wide energy strategy in the UK entitled 'Action Today for Energy Tomorrow – The Energy strategy for Cornwall'. The strategy has been signed by 72 strategic partners (including Cornwall County Council and all of Cornwall's District and Borough Councils) that have agreed to work in partnership to deliver 32 key actions across the public, private, health and education sectors.

Cornwall County Council and the other 7 local authorities in the county are active members of the Cornwall Sustainable Energy Partnership which is a consortium of over 80 organisations from the public, private, education and health sectors.

CAG Consultants (2006) Sustainable energy peer support toolkit for local authorities

The expansion of the Kick Start Partnership across all authorities in the Region needs to explore the extent to which it can address energy efficiency issues as people access home improvement loans.

Energy suppliers are required to spend a proportion of their turnover on the Energy Efficiency Commitment (EEC) with a requirement to target needy households. Whilst energy suppliers theoretically have the potential to target every household in the region, the cumulative impact of EEC has been relatively limited compared to the potential impact.

The EEC has now been replaced by the Carbon Emissions Reduction Target (CERT) programme, which will seek to double the spending and broaden the target market for support, to include a requirement to spend a proportion of the allocation on micro-generation. The utilities are beginning to take a more pro-active stance on providing support for energy efficient, although their participation in 'energy service' type arrangements that encourage and sell efficiency has been poor to-date.

With the limited budgets available to tackle fuel poverty Local Authorities are increasingly looking to work together at a regional and sub-regional level through partnerships such as Kick Start to pool resources, improve economies of scale and share best practice. There are a number of good examples of formal partnerships that have developed through Sustainable Community Strategies that could be relevant to the region, with Cornwall County Council standing out, having received a Beacon Council Award for its Sustainable Energy Partnership (see case study).

Engaging with 'fuel rich' owner occupiers

Whilst heating bills can represent a substantial burden for poorer households living in hard to heat properties – particularly in the social and private rental market - for many owner occupiers energy costs represent a much smaller proportion of total household overheads.

The price signals don't at present appear strong enough to influence people's choices and behaviour – although recent market research by Ipsos-MORI has shown that there is growing awareness and concern about energy bills, particularly in the light of recent price rises.

In order to make substantial in-roads into domestic carbon emissions this 'fuel rich' owner occupier market will need to be tackled. There are few examples in the UK of programmes which have had significant success in targeting this market – as evidenced by the Energy Saving Trust's HEED database and the low level of micro-generation installations.

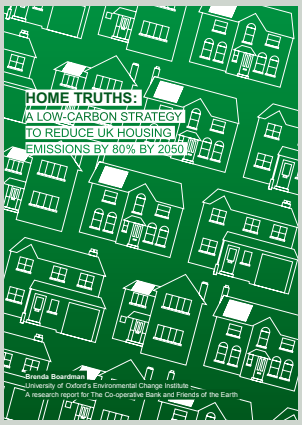
Only now with increasing awareness of climate change and energy price rises are 'pioneers' starting to emerge that are 'willing to pay' for home improvements and renewable energy technologies emerging – as highlighted by case studies compiled by the Oxford University Environmental Change Institutes 40% House project, the Sustainable Development Commissions 'Stock take' report, and the Sustainable Energy Academy's 'Old home, super home' programme (see below).

Home Truths: A national vision for low carbon homes

The Home Truths report was prepared for Friends of the Earth and the Co-operative Bank and sets out a low carbon strategy to reduce domestic CO_2 emissions by 80%.

Since 1997 domestic emissions have risen by 5%, and the projected increase in households over the next few decades creates the risk that domestic emissions could rise, jeopardising climate change objectives.

The report highlights the fact that it is still neither cheap or easy to make a home low carbon. It sets out a vision for low carbon homes in which every house is well insulated and no household spends more than 10% of its income on energy.



The report calls for a programme of 'market transformation' combining tough new standards, generous provision of grants and low cost finance. The benefits would be healthy homes and the outlawing of fuel poverty, stimulating the creation of new jobs and business opportunities.

Source: Boardman,B (2007) Home Truths, University of Oxford

Recent research by Brenda Boardman at the University of Oxford has suggested that no single measure can achieve the change required. Instead a strong overall framework is required for action bringing together a range of policies, strategies and mechanisms. Practical action is also needed to improve the effectiveness of outreach, economies of scale and to put in place mechanisms to stimulate investment.

In the Housing Character Areas explored by this report we highlight a number of emerging examples of approaches that could, as part of a coherent framework for action, begin to stimulate the market, putting them into the context of the four different areas.

New-build housing trends and projections

The last decade has seen a dramatic change in the location and type of dwellings making up the West Midlands' private housing completions. In 1995-96 houses comprised over 90% of private completions, with an even split between 2,3 and 4 bedroom properties.

However, in the space of a decade this position has transformed, with flats now comprising 46% of private completions, predominantly consisting of 2 bedroom units. This change reflects a policy and market shift towards higher density housing on brownfield sites. The split has remained broadly 60:40 in favour of houses for the new social housing stock, with a marginal increase in the number of flats.

Whilst data breaking down the completion of new housing by size of housebuilder is not readily available for the West Midlands region, the National House Building Council compiles national data for the completion of certified property (around 80% of completions). Extrapolated to the West Midlands this would suggest that a significant proportion (40%) of new-build housing is completed by smaller housebuilders completing less than 500 units annually.

Whilst for some companies this could be a barrier to progress, as they may not have the same internal resources as the large housebuilders to respond to new regulatory requirements, at this present point in time, it is the smaller, specialist housebuilders and Registered Social Landlords (RSL's) that are leading the way in the owner occupier market – seeking to create a higher value niche 'green' product. This is, however, likely to change rapidly as regulatory

Annual starts by size of UK housebuilder (2000-2004)

	Number of units (%)						
Year	1-10	11-30	31-100	101-500	501-2,000	2,000+	Total starts (,000)
2000	8	7	7	14	16	49	145.4
2001	8	7	9	13	17	46	145.1
2002	8	7	8	14	14	48	161.9
2003	8	7	8	13	13	50	168.6
2004	8	8	9	14	13	48	173.8

Source: National House Building Council (2005)

pressures require the larger regional and national housebuilders to improve performance.

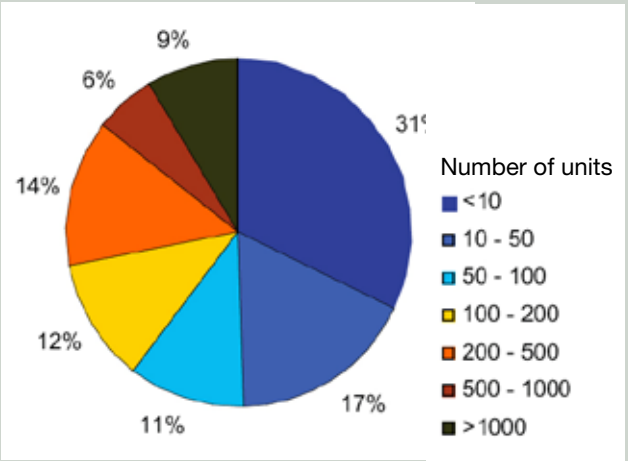
In line with the direction of government policy many RSL's are moving into the intermediate housing market – providing low cost home ownership with shared equity options for first time buyers. Recent schemes such as Sillins Avenue in Redditch (Accord Housing Association) and Park Central in Birmingham (Optima Housing Association) have included shared equity and 'homebuy' units. This suggests that the role of RSL's in delivering homes for sale is likely to increase over time – with the potential to use their influence to mainstream higher performance standards.

Another important trend is the rising proportion of RSL units being delivered by mainstream housebuilders. As planning on Greenfield sites has been precluded by government policy, the focus has shifted onto brownfield land in urban regeneration areas where Local Authorities are typically requiring a 20-30% affordable housing proportion from private schemes. In many cases housebuilders seeking to position themselves as developers of 'sustainable communities' are opting to build the units as part of their schemes, often partnering with RSL's to access housing grant.

The scale of new developments will also have an impact on the cost and response to the Code for Sustainable Homes. Again, here, statistics are not readily available at a regional level. National statistics suggest that 60% of completions are on developments of less than 200 properties, and 30% of completions are on developments of less than 10 properties. This breakdown can be used to provide an indication of the technologies and strategies that may needed for different scales of development being completed in the region.

Whilst larger sites are more likely to be well suited to communal systems such as CHP supplying community heating, these smaller sites may require different models, such as roofspace agreements to reduce the capital cost for housebuilders and homeowners by allowing an ESCo to make use of their roof for solar heat and power.
An intelligent approach to each site by all stakeholders will be important in managing the costs of compliance with the Code for Sustainable Homes.

Indicative scale of developments for UK new-build completions



Source: Renewables Advisory Board (2007)

Regional housing projections to 2026

The current Preferred Option under the Regional Spatial Strategy (RSS) Phase 2 revision provides proposals for new-build housing through to 2026. The current Preferred Option suggests a build rate of around 19,000 (2006-2016). This is a 'net' figure and does not include any provision as a result of demolitions and replacements.

The RSS Phase 2 revision assumes an overall 1:1 replacement rate for demolished homes and an overall growth in the housing stock or around 0.7% per annum. This will require a significant increase in the number of new housing completions and presents a challenge to housebuilders, planners and for public sector land allocations.

The projections make the presumption that up to 3,000 properties will be demolished each year, largely in the two Housing Market Renewal Pathfinder areas administered by Urban Living (Birmingham and Sandwell) and RENEW (North Staffordshire), to be replaced by units netted within the housing projections. On the basis of the suggested 1:1 replacement of demolitions, this represents a relatively low replacement rate of the housing stock at around 2% gross in 2026

Demolition and replacement is likely to benefit the overall aim of moving towards low carbon housing by seeking to remove the most hard to treat properties. However, nationally commentators such as Brenda Boardman from the University of Oxford have proposed significantly higher demolition rates in order to increase the replacement rate. While there is some correlation these programmes do not necessarily target the hardest to treat homes and are focused on neighbourhood renewal.

Social rented and shared equity housing are likely to account for between 10% and 15% of the projected new stock by 2026. The actual figure is likely to be at the higher end due to the government's increased

Indicative annual new-build projections (WMRSS Preferred Option)

Planning area	Historical build rate 2001 - 2005	Preferred Option 2006 - 2026
Birmingham	3,016	3,344
Coventry	716	976
Black Country	2,452	3,996
Solihull	537	600
Metropolitan Area Total	**6,721**	**8,916**
Shropshire	1,148	1,164
Telford and Wrekin	694	1,200
Staffordshire	2,813	2,716
Stoke-on-Trent	721	840
Warwickshire	2,586	2,100
Worcestershire	2,101	1,892
Herfordshire	588	820
Shire and Unitary Total	10,649	10,732
Major Urban Areas	7,648	10,056
Other Areas	9,722	9,592
West Midlands Region	**17,369**	**19,648**

Source: West Midlands Regional Assembly (2007) West Midlands RSS – Phase Two revision options

Projected new-build completions and Code for Sustainable Homes performance

Completion period	Projected Units	Proportion of housing stock	Regulatory performance
Low carbon 'Current'			
2006-2007	39,296	1.7%	Building Regulations Part L 2002
2008-2010	58,944	2.5%	Building Regulations Part L 2006
Low carbon 'Advanced'			
2011-2013	58,944	2.5%	Code for Sustainable Homes level 3
2014-2016	58,944	2.5%	Code for Sustainable Homes level 4
Zero carbon 'Future'			
2017-2026	**196,480**	**7.5%**	**Code for Sustainable Homes level 6**
Cumulative 2026 total			
RSS timescale	412,608	15.7%	2.3% stock replacement 3.7% 'Modern' new homes 4.5% 'Advanded' low carbon new homes **7.5% 'Future' zero carbon new homes**

emphasis on the need for more affordable housing. A shift in the definition of 'affordable housing' suggests that this will combined social renting with different forms of shared equity, with some of the housing grant allocated to households under 'Homebuy' initiatives that may support the purchase of private new-build or existing units.

Based on these projections it is possible to estimate the scale of the contribution that new-build housing could make to regional emissions targets, based on the impact of current Building Regulations and their future convergance with the Code for Sustainable Homes. A time lag of 1 year has been assumed in order to take into account the timescale between new regulations coming into force, the first detailed planning applications and practical completion.

Enforcement of the Code for Sustainable Homes

Enforcement of the Code for Sustainable Homes on the scale implied by the regional housing projections raises a potential barrier to delivery of the low and zero carbon homes. A major concern is the potential conflict between the additional costs and the strong drive from central government to deliver more homes.

This may become more apparent if there is not closer working between Local Authorities and housebuilders to address the high cost and complexity of compliance with Code levels 5 and 6 - an issue which we discuss further in the findings from our case study review (see accompanying document). The failure of the California Clean Air Act provides a good precedent that highlights the need for dialogue with the housebuilding industry.

Furthermore concerns relating to the level of enforcement of the current Building Regulations by Local Authorities across the UK were raised in research carried out for the Energy Saving Trust in 2006, with lack of resourcing and prioritisation highlighted as issues. National surveys of completed homes by the Building Research Establishment in 2004 also highlighted a significant level of non-compliance with Part L of the Building Regulations.

To some extent the cost and resourcing of Code compliance may be offset by the use of accredited assessors paid for by developers. However, new resourcing and capacity building by Local Authorities are likely to be required in order to effectively enforce robust detailing standards, manage the new requirement for sample testing and scrutinise overall compliance.

Case study: The California Zero Emission Vehicle mandate

The California Air Resources Board (CARB) recognised that the State would not be able to tackle its air pollution problem without putting cleaner cars on the road. It established the Zero Emission Vehicle (ZEV) programme in 1990 and passed a mandate that required major car manufacturers to stimulate the market for zero emission vehicles, setting targets for putting vehicles on the road.

DaimlerChrysler, Ford, General Motors, Honda, Nissan and Toyota were required to put between 4,450 and 15,450 electric ZEVs on California's roads by 2003 (10% of new vehicles produced), with the numbers progressively increasing over the following decade. The mandate was eventually repealed as the industry sought to demonstrate that there was no demand for the vehicles, and CARB was subject to a legal challenge that questioned the practicality of the mandate targets.

Source: California Environmental Protection Agency (2008)

URBAN RENAISSANCE

The urban renaissance of regions major cities has led to a boom in the development of high density development typified by a mix of residential, commercial and retail uses. This has largely been driven by changes in demographics and aspirations for young people in particular to live in the centre of cities such as Birmingham.

New-build opportunities will largely take the form of thermally efficient apartment blocks with minimal heat loss walls, forming part of mixed use developments in each city centre and as part of edge of centre masterplans such as Eastside in Birmingham.

The existing stock consists largely of apartments constructed in the last 10 years the majority of which have electric space heating and domestic hot water systems with high associated CO_2 emissions, as well as local authority 1960-70's high rise blocks which may create significant opportunities for insulation overcladding and heating system improvements.

Refurbishment opportunities are likely to take the form of 19th Century industrial-era buildings - including mills, warehouses and works - and 20th Century office buildings.

URBAN RENAISSANCE

New-build apartments and refurbishment schemes

The urban renaissance taking place in West Midlands cities has led to the development of intrinsically more thermal efficiency apartment blocks with minimal heat loss walls. These blocks have formed part of mixed use developments in city centres, in-fill regeneration quarters and edge of centre schemes.

Schemes have also included the refurbishment of 19th Century industrial-era mill and warehouse buildings, and 20th Century office buildings, each of which create unique challenges to improve their building fabric to modern standards – although to-date refurbishment schemes have shown a limited response to the need to improve reduce CO_2 emissions.

Contemporary apartment design

The contemporary design of urban renaissance apartment schemes raises specific issues. The European experience of major low energy urban developments with contemporary design such as BO01 in Malmo, Sweden – the subject of a particularly critical post-occupancy survey - suggests that greater attention to detailing is needed and that large glazed areas and protusions should be reduced as they can increase heat loss.

Tall residential towers also raise concerns about their fundamental sustainability.

These include the additional energy required above 10-15 floors for water and the demand for lifts. Additional concerns are the reduction in natural daylight from the need to use solar control glass as well as the increased heat loss and wind buffeting that occurs at greater heights.

The proliferation of small flats with internal corridor access and single aspects raises concerns about the quality of natural lighting and ventilation, opportunities for climate change adaptation and the future flexibility of spaces. Studies of residential amenity in European high density residential areas suggest that dual aspects are important for people's quality of life and wellbeing, as well as maximising natural daylighting and allowing for passive cross ventilation.

Mill and warehouse refurbishment

The refurbishment of mills and warehouses has played a consistent part in attracting people back to live in city centres, and conversion schemes have traditionally attracted high values. Whilst these buildings will tend to have high levels of thermal

Case study: Titanic Mill, Lowry Renaissance

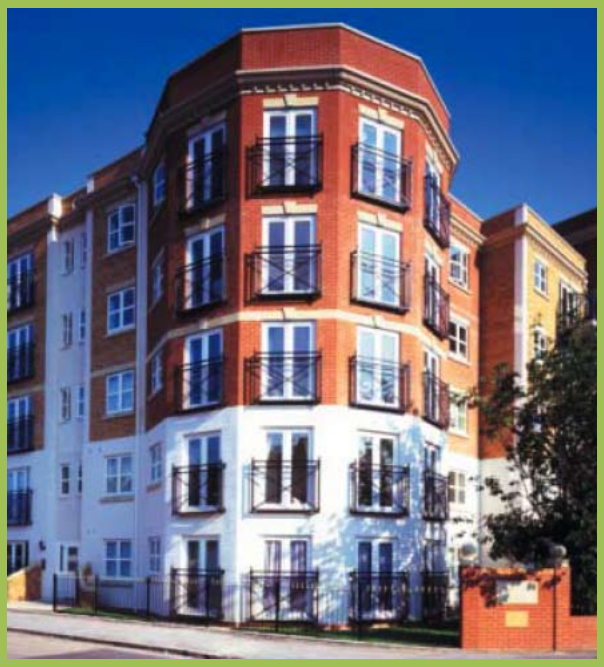
Titanic Mill is a Grade II Edwardian structure located in the village of Linthwaite near Huddesfield. The refurbishment consists of over 150 apartments with a spa occupying the ground floor. It has been developed by Lowry Renaissance, a partnership between local developer Renaissance Ltd and Manchester based housing developer Lowry Homes who both believed that there was demand for high quality, zero carbon homes.

See accompanying case study report

Case study: Connecting to community heating, Barratt Homes

Barratt Homes has connected properties at Park View, a development of 108 apart¬ments consisting of 1, 2 and 3 bedroom apartments, to Southampton District Energy Scheme. At first they were nervous of the system, with concerns relating to security of supply for their buyers, the capital cost and the cost of the energy for residents. An early dialogue with Southampton's contractor – Utili-com – resolved many of the concerns. A post-occu-pancy survey was carried out following completion of the scheme. This confirmed that residents were very happy with the heating system, and the quality and value of the service it provided.

See accompanying case study report



mass, their historical fabric performance tends to be very poor. Improving this performance should by necessity form part of their refurbishment, but there are few examples due to the additional capital cost.

Recent UK schemes such as Titanic Mill in Linthwaite near Huddesfield (see case study below) and Royal Mill in Manchester demonstrate that this need not be the case, with the high standard of the refurbishment being easily absorbed into the costs and good sales values.

Developing CHP and Community Heating

The higher densities being achieved by urban renaissance schemes create significant potential for the viable development of community heating, which could be supplied by natural gas-fired CHP or biomass CHP and boilers. The potential to link together residential, commercial and public sector buildings, such as schools and medical facilities, in close proximity has the potential to further increase the viability of this option.

As confirmed by costings carried out by Cyrill Sweet for the Housing Corporation, gas-fired CHP supply-ing community heating offers the most cost effec-tive way of delivering a low carbon energy supply for new-build homes, and is a fundamental building block if urban neighbourhoods are to respond to the Code for Sustainable Homes.

Community heating has traditionally met with resistance by private developers, with a range of objections being raised including additional cost, consumer concerns about monopoly and the guar-anteeing of low energy prices, and security of sup-ply. There is growing evidence that many of these concerns can be fully addressed through a contract with an Energy Service Company (ESCo) stipulating the terms and conditions of supply.

Barratts Homes are a good example of a main-stream housebuilder that has connected properties to a number of community heating networks – both city-wide (see case study below) and standalone for schemes such as Comet Square in Hatfield. Post-occupancy surveys have demonstrated a high level of satisfaction – particularly because it requires moving away from unpopular electric heating sys-tems – and reduced capital cost for Barratts.

HOUSING MARKET RENEWAL

Regeneration and Housing Market Renewal areas can be found at the edge of the centres of most of the region's major towns and cities, as well as taking the form of Council overspill estates and housing estates originally associated with industry.

These areas are characterised by a range of different types and ages of housing, as well as mixed use local and district centres. The housing typologies include Council housing estates - which may be the subject of stock transfer - 19th Century terraces and interwar flats. Each will require a different refurbishment solution.

In the region's Major Urban Areas regeneration bodies such as the Walsall Regeneration Company and the regions two National Housing Market Renewal Pathfinders are carrying out the improvement, remodelling and selective demolition of properties to achieve Housing Market Renewal and to meet Decent Homes Standards.

Significant associated investment is taking place in new mixed tenure housing, often based on partnerships between private sector developers and Registered Social Landlords. The urban renaissance of the West Midland's towns and cities is also driving the need to expand and diversify the range of urban housing currently available beyond just apartments.

These sites therefore represent a major opportunity for private developers and given that some sites will be publicly owned, or will have been assembled by the public sector with additional public sector grant for social housing, schemes will generally be expected to meet higher standards for CO_2 reduction.

HOUSING MARKET RENEWAL

Mixed tenure new-build and refurbishment strategies

With the focus of planning and housing policy on brownfield sites, and the resulting constraints on the supply of land, housebuilders and property investors are becoming increasingly aware of the need to become strategic regeneration partners in order to access development opportunities.

This creates opportunities for Local Authorities, Housing Market Renewal (HMR) Pathfinders and Urban Regeneration Companies (URC's) to require private sector partners to meet carbon reduction standards and to incorporate low carbon and renewable energy technologies into schemes.

Innovative new-build interventions

The low sales values achieveable for housing in low demand areas may, however, limit the scope for developers to invest in low carbon and renewable energy measures. Local Authority aspirations and planning requirements could, in this instance, be realised by adjusting the value of the land – as demonstrated by innovative schemes such as Showell Park in Wolverhampton (see case study below) – or by taking an equity stake in schemes that can be released through property sales.

Council housing stock improvements

Council housing stock can range in form from Radburn-type terraced units to deck access maisonettes and high rise tower blocks. A key driver is for the improvement of Council Housing stock is the need to tackle fuel poverty.

Improvement works have tended to focus on thermal efficiency and heating systems, as required under the Decent Homes Standards, and can also contribute to the turning round of the image of estates with a consequential improvement in rental income and right to buy applications.

The budgets currently available to meet these standards are not, however, sufficient to raise properties to 'low carbon' standards. Additional investment is therefore needed, as demonstrated by Castle Vale Housing Action Trust in the late 1990's and early 2000's that has successfully improved

Case study: Haslam Homes, Wolverhampton

Showell Park is a scheme of 205 residential units being developed by Haslam Homes. It comprises a mix of flats and houses, and will also provide 32 affordable housing units to be managed by Midland Heart. The development brief for envisaged high design standards and an Ecohomes score of at least Very Good.

The City Council reserved the right not to take the highest bid for the site, and instead opted to take a lower capital receipt in order to secure the social and environmental benefits of Haslam's proposed scheme. The adjusted land value primarily paid for the integration of solar thermal collectors onto monopitch roofs. These will provide hot water and space heating for the new homes.

See accompanying case study report

Case study: Castle Vale Community Housing Association

Castle Vale is a former Council housing estate located five miles north east of Birmingham. The estate was transferred over to Castle Vale Housing Action Trust (HAT) in the 1993 and during the following twelve years it carried out a comprehensive programme of investment to improve and rebuild 2,500 homes. Castle Vale Community Housing Association took over management of the estate following a ballot of tenants and residents in 2003.

From the outset there was extensive consultation with tenants and residents in order to take forward the programme. A wide range of home improvements and external works were carried out in order to improve the quality of life for people living on the estate. These included an emphasis on improving the SAP ratings of properties, with the Housing Corporation requiring ratings of at least 65-70.

See accompanying case study report

the SAP ratings of properties in order to achieve high performance standards – with a focus on the remodelling of low rise property and the remaining tower blocks. This approach has been emulated by other stock transfers including Optima Community Association in Birmingham and Arms Length Management Companies such as Sandwell Homes.

Whilst semi-detached and terraced Radburn-type units are relatively easy to remodel in order to improve their thermal efficiency – as demonstrated by the Plymouth Grove Private Finance Initiative (PFI) in Manchester - larger deck access and high rise blocks are more difficult and expensive to treat, requiring solutions such as overcladding and careful detailing in order to reduce thermal bridging – as demonstrated by the Angell Town project in Brixton, in London.

An alternative approach is to invest in community heating supplied by CHP, as demonstrated by Aberdeen City Council which has established a community-led ESCo to supply its housing stock. The high projected cost of improvements for its hard-to-treat high rise stock meant that Community Heating represented the most cost effective, and therefore feasible, measure to tackle fuel poverty and reduce CO_2 emissions.

Other stakeholders in the energy market have a potential role to play in targeting the fuel poor. Utilities, for example, could be encouraged to carry out improvement surveys for vulnerable households, which could be triggered when a household is put onto card pre-payment meters. Card meters tend to force tenants to pay very high unit costs for their energy, forcing them to ration their use - particularly during times of greatest need.

Pathfinder renewal areas

In many Housing Market Renewal Pathfinder areas the problems of low demand have tended to relate to the deteoration of older pre-war housing stock, with residents lacking the resources to maintain properties, and private landlords exacerbating the decline. Private landlords have traditionally proved difficult to influence, however, accreditation schemes such as Coventry's Accredited Property

Scheme provides and example of how standards can be raised, and investment encouraged.

There are a number of examples of how comprehensive refurbishment to low carbon standards can be used to turn this situation around, including projects by Pathfinders in Manchester, Salford and Lancashire. At Northmoor in Manchester whole terraced streets were assembled and transferred to Manchester Methodist Housing Association. Comprehensive refurbishment and remodelling of the properties was then carried out with initial government support, and properties were then either rented by the Housing Association or sold outright. The result has been an uplift in property values that has been significant enough to pay for substantial refurbishment works.

In the region RENEW North Staffordshire has been examining how it could emulate the Northmoor model on a self-sustaining basis. The model requires significant upfront public funding, and VAT rules mean that refurbishment is not attractive for private developers – as demonstrated by Urban Splash's Chimney Pot Park project in Salford, where traditional terraces were demolished, retaining only their facades. This barrier can be overcome if the properties are assembled by the public sector and then transferred to an Registered Social Landlord on a repairing lease, followed by the sale of some properties on long leases.

A model eco-terrace project is currently being taken forward in Newcastle-under-Lyme by Staffordshire Housing Association with the support of RENEW and will explore the specifications required to bring terraces up to standard. RENEW has also initiated a range of work to support the local supply chain for refurbishment, including the capacity building required to provide window replacements in conjunction with Stoke City Council.

Communal solutions for terraced housing

Terraced housing of the kind commonly found in housing market renewal areas accounts for around a quarter of the UK's housing stock. Its compact

Case study: Northmoor, Manchester Methodist Housing Association

Located in East Manchester the area of Northmoor historically supported large numbers of two bedroom terraced properties built in the late 19th and early 20th century. Much of this accommodation proved unpopular to homebuyers and subsequently transferred into the private rental market which resulted in a variety of socio economic problems typical with a transient population.

In order to address the issues affecting Northmoor Manchester City Council embarked on a joint venture with Manchester Methodist Housing Association (now part of the Great Places Housing Group). The refurbishment works carried out included re-roofing (where necessary), new doors and double glazing, dry lined insulation and loft insulation to reduce damp and improve thermal efficiency, and new condensing gas boilers. The project has turned around the areas housing market, with a number of the properties sold on a shared equity basis.

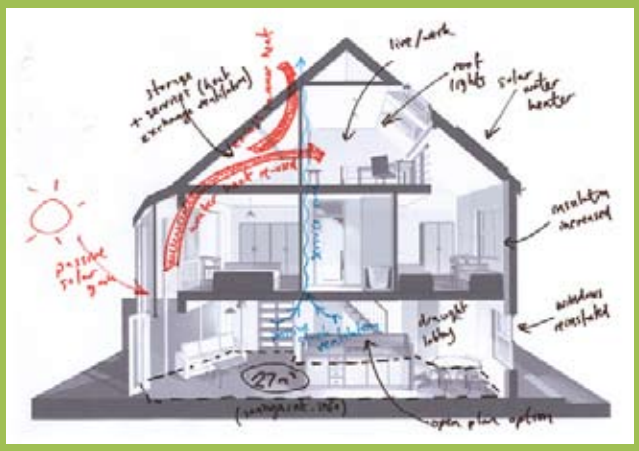
See accompanying case study report

Case study: Eco-terrace project, Newcastle-under-Lyme

The Eco-terrace project is being carried out by Staffordshire Housing Association, with funding provided by RENEW North Staffordshire, Newcastle under Lyme Borough Council and the Housing Corporation. The project will improve six Victorian long standing vacant terraced properties and is part of a package of improvements designed to stimulate regeneration and improve the housing market offer.

A competition was run to generate ideas for how they could be refurbished to a modern standard. The winning concept sought to 'radically improve the energy performance of the properties and provide environmentally friendly, well designed accommodation using techniques and principles that could be repeated on other properties of a similar nature.' Work began on site in early 2008 and the terraces will be the subject of a post-occupancy monitoring programme.

Source: Eco-terrace.co.uk (2007) The energy saving refurbishment



form minimises heat loss walls, and creates opportunities for the retrofitting of fabric improvement measures, as well as a range of low carbon energy supply technologies, with the potential to achieve significant economies of scale by targeting whole streets. Key opportunities could include:

- Communal biomass heating or gas-fired CHP: Research has shown that terraced housing can require some of the shortest community heating pipe runs, making it a relatively cost effective form of housing for retrofitting. Retrofit projects could form part of fuel poverty strategies in regeneration areas. The compact form could also enable biomass community heating to be cost effective, with land for fuel storage facilities more likely to be available in lower value areas.

- Solar mini-grids: Instead of wiring solar photovoltaic arrays to supply individual properties, with the associated requirement for smaller inverters and net-metering, mini Direct Current electricity grids could be used to link together the rooflines of whole streets in order to supply electricity to the local distribution network via a single point of connection. This has the added advantage of enabling the Renewables Obligation Certificates (ROC's) to be cost effectively claimed for the electricity generated.

Barriers to the development of projects include the diversity of tenures to be found in a typical inner city terrace, and the short termism of private landlords in low demand areas. These could be overcome through the use of an Energy Service Company (ESCo) model to finance solar or biomass technology on the basis of energy sales to residents or the national grid. Local authorities could assist projects by using their well-being powers to, for example, grant 'wayleaves', or rights to carry out roadworks, to lay community heating mains in the streets.

SUBURBAN HEARTLANDS

The suburban districts which characterise the commuter belts of the region's Major Urban Areas largely consist of detached and semi-detached homes. These districts contain the majority of the regions homes, and some of the oldest housing stock with the greatest heating demand and the lowest SAP ratings.

They are also likely to contain households with the most interest in investing and adding value to their properties. Heritage concerns may, in some cases, limit the potential for solutions that could affect the external appearance of properties – such as external insulation.

Because of the low net densities of the suburbs 'micro-generation' technologies are likely to be the most appropriate energy supply technologies for deployment. This creates a challenge because much of the existing housing stock falls outside of the direct influence of the planning system.

Novel market mechanisms will be required in order to increase the deployment of both improvements to the building fabric of suburban homes, and micro-generation technologies – with the need to focus on achieving a critical mass of home improvement works in each neighbourhood in order to improve the economies of scale and bring down the unit costs.

SUBURBAN HEARTLANDS

Strategies to engage and support owner occupier households

The majority of the population of the West Midlands live in lower density suburban areas characterised by a mix of terraces, semi detached and detached properties. The majority of this property pre-dates the onset of Building Regulations to conserve heat and power in 1965, and their larger floor and external wall areas can result in significant space heating requirements. The majority of suburban properties are owner occupied, creating a significant challenge in seeking to influence the individual choices of owners within housing market.

Careful engagement is also needed with local, regional and national heritage bodies such as English Heritage in order to develop solutions where restrictions may apply to the external works that could be carried out. Local Authorities have the potential to take the lead in brokering this dialogue, and in negotiating Permitted Development Rights. English Heritage are currently running a project to explore how typical properties can be brought up to standard without affecting their heritage value

Local Authority strategies

With the exception of situations where households are undertaking major extensions and refurbishment works, there are few mechanisms that local authorities have – either through planning or building control – to influence the existing housing stock and there is some doubt as to the quality of the data on reported improvements reported under the Home Energy Conservation Act (HECA).

However, with the Local Government White Paper highlighting the key leadership role of local authorities in tackling climate change, there is still a significant role for Local Authorities to play in establishing and co-ordinating strategies targeted at the existing housing stock.

Recent examples include Stroud District Council which, inspired by the Oxford Environmental Change Institutes report, has begun to develop a 40% Homes strategy, and Wychavon District Council, which has initiated a thermal imaging survey of the area. Stroud has commissioned the Severn Wye Energy Agency to develop the strategy, and it will form the starting point for further work on precedents and mechanisms. Wychavon have made the results of the thermal imaging survey public access, with the ability to identify homes by postcode.

Case study: Developing a '40% house' strategy, Stroud District Council

In 2006 Stroud District Council initiated a 3 year programme of work on climate change, which included a specific focus on the domestic sector. The Council have commissioned Severn Wye Energy Agency to scope out a strategy to achieve a 60% reduction in CO_2 emissions from existing homes. The main focus has been on how private homeowners can be encouraged and enabled to reduce their emissions.

The initial work has looked at the characteristics of the housing stock. Sample surveys have been carried out in order to assess the costs and potential sources of finance. This has suggested that an investment of around £26k is needed for each home, with between £10-15k required for building fabric improvements.

The local supply chain to support improvement works has also been investigated, and consumer survey has been carried out to test attitudes to the different mechanisms that could be employed.

Source: Severn Wye Energy Agency, 40% house feasibility study, November 2007

Case study: Thermal imaging survey, Wychavon District Council

The council commissioned aerial photography and thermal imaging of the district in order to produce a map showing the energy efficiency of every home in the district. The maps use a five-colour code to rank buildings from red (poor) to green (good). The rankings demonstrate where people are using too much energy or have poor insulation. Members of the public have reacted enthusiastically, with the results providing clear evidence of where energy is being wasted.

The aim of the survey was to help promote Government grants and subsidies that are available towards the costs of improving heating systems and installing insulation. The survey cost £28,000 and it has helped unlock £70,000 worth of funding from Defra under the Climate Challenge Programme in order to promote the grants.

Source: Worcestershire News, archive.worcesternews.co.uk, 25th October 2007

The Wychavon and Stroud initiatives highlight the importance of high quality, meaningful survey data in order to form the starting point and baseline for local action. This can take a number of different forms, from sample surveys of house and apartment types, to authority-wide GIS data using tools such as thermal imaging. New systems are also needed to feed details of actual improvements to homes, and low carbon technology installations, into the national HEED database.

Supporting 'pioneer' owner occupiers

The market for low carbon refurbishment is poorly developed. This means that there are very few examples that people can see of what can be achieved, and for households wanting to improve their home they face an uphill struggle to understand and manage the process. As the University of Oxford's 40% house project highlighted, 'pioneer' households often have to go up a steep learning curve, taking time to research the options, co-ordinate contractors and to finance the works.

The solution therefore needs to focus on two main barriers – the first is the need for 'pioneers' to avoid re-inventing the wheel each time, based on a more 'open-source' approach to capturing and making available the learning from projects, and the second is the development of support mechanisms and service companies that can co-ordinate and make home improvements easier and cheaper.

The need for support will increase as Energy Performance Certificates are fully implemented across the existing housing stock, with the potential to target support at the progressive improvement of E, F and G rated properties. With over 1.5 million suburban properties requiring attention, this could create a significant business opportunities for skilled trades in the region.

'Home improvement service companies' bringing together installers and refurbishment specialists could carry out works tailored to a homeowners' budget and aspirations. This kind of home makeover service is currently being trialled in the form of the new 'Green Concierge' service in London with the support of the London Development Agency, and is also available in the region through Hestia's 'Grow your own energy' website.

Developing outreach and support services

Novel approaches to outreach are needed in order to increase the initial uptake of home improvement works and low carbon energy technologies by households. A key opportunity to undertake improvement works is when homes change hands. Up to 100,000 properties change hands each year in the region, and these could be a major target for outreach programmes, potentially working with estate agents, surveyors and mortgage providers to re-inforce use of the new Energy Performance Certificates.

Trust in suppliers is a major concern for consumers, with the confusing array of marketing material for low carbon products, and tales of 'solar cowboys' preventing the creation of a more mature marketplace. To overcome these barriers Local authorities and non-profit public and private sector organisations have an important role to play in providing access to intelligent and impartial information on technologies and installers.

Their role could be supported by work at a regional and sub-regional level to re-enforce quality standards and support supply chain development – for example, by making the link to existing accreditations such as the Renewable Energy Associations REAL Assurance scheme for installers, and through updates to trade listings.

Community-led organisations

The establishment of community-led social enterprises and co-operatives to provide trusted energy efficiency advice, stimulate local demand and co-ordinate installation work is a model that has worked in Canada and the USA and could have potential in the West Midlands (see below).

Their key benefit is that they can help unlock local potential by engaging at a grass roots level, providing a clear route for people to take action, and by bringing together households creating better economies of scale. Smart metering could also be promoted through this route in order to provide households with information in order to influence their behaviour.

With increasing public awareness of environmental issues and the need for positive action on climate change, there could be significant potential for community-scale and non-profit bulk buying initiatives of the kind pioneered in the USA by energy co-operatives and in Canada by the highly effective 'Green Communities' network.

These types of organisations can act as neutral brokers for advice and information, as well as screening suppliers and installers so that householders don't have to do the work and make costly mistakes.

There is good precedent for this approach from Canada's Green Communities Network, and the UK government is interested in emulating their experience. Green Communities was established as an initiative by the Ontario government in the early 1990's. Its aim was to support the establishment of non-profit Green Communities organisations in

Case study:
Green Home Concierge service, London

Launched in 2007 this innovative new service is being delivered by lifestyle services company TEN with the support of the Mayor of London and the London Development Agency. For £199 per year households can access trained 'home energy advisors' who will visit their home, model its energy performance, and provide detailed recommendations on measures they can take.

In support of the service TEN have developed the 'GREEN maid' database of products and approved suppliers. Specialist installations can also be researched and co-ordinated on request, for example, TEN can research the most effective solutions to retain heat in a specific property type. Energy Performance Certificates and real-time energy meters can also be provided for an additional fee.

Source: Green Homes Concierge, www.greenhomesconcierge.co.uk

Case study: Green Communities Associations, Canada

Green Communities were initiated in Ontario in the early 1990's and pioneered the use of home audits to encourage households to reduce their energy use. The approach was then formally supported by the Canadian government as a framework for establishing not-for-profit companies that can tailor their approach to local circumstances in order to help households, neighbourhoods or districts to reduce their environmental impact.

Since 1991 Green Community organisations have been established by local people across Canada with their activities including delivery of home visits, co-ordination of local development projects, arrangement of low interest loans and one-stop-shop advice services for grants and advice. This approach has been very successful, with Green Community Associations having sold over £200 million worth of environmental products and services.

Source: Green Communities Canada, www.gca.ca

major towns and cities. Their main tool has been home visits, coupled with the ability to co-ordinate the delivery of measures which households choose to implement.

The role of community 'champions'

Community representatives and 'champions' working through existing organisations such as Development Trusts, or even new enterprises modelled on the Green Communities approach, are likely to be in a strong position to influence people in their local community. To maximise their potential impact they will require access to high quality training so that they can then provide the informed outreach within their local communities.

The process for identifying champions will vary greatly from area to area and, depending on local circumstances, Local Authorities may not always be in the best position to do this – creating a potential role for arms length bodies such as EEAC's and Local Strategic Partnerships. Hestia Services are currently carrying out research looking at 'what drives communities' and how this potential can be harnessed to improve the take-up of energy efficiency and renewable energy.

Strategies for engaging with households

There have been a number of projects in the UK which have sought to emulate the home visit-based approach. These include Eco-teams which has been trialled in Yorkshire and the West Midlands, Action for Sustainable Living which was established in Manchester, and most recently the Green Homes Concierge service in London.

In the region British Gas are supporting a 'Green Streets' project in Birmingham which challenges communities to reduce their CO_2 emissions, and Marches Energy Agency have initiated a number of local projects including 'low carbon communities'. These projects have met with varying success, creating potential models for engaging with communities but often lacking support for the implementation of practical measures.

In the USA energy co-operatives, such as Co-operative Community Energy in California, have been successful in providing trusted advice to households and businesses as well as seeking to reduce the cost of renewable energy installations. CCE claims to be able to offer members discounts of up to 25% through bulk purchasing and installation, as well as assisting with grant applications and the sale of electricity to maximise revenue.

Case study:
Co-operative Community Energy, USA

Established in California in 2002 Co-operative Community Energy is a member owned, not-for-profit business which supports households and businesses who want to install solar energy. It was established to overcome four specific barriers to greater uptake of solar energy:

- Consumer awareness and understanding;
- Places where products can be purchased from;
- Trained installers and inspectors;
- Access to financing options.

To support these aims the co-operative provides design and project management services to its members, and by bulk purchasing on behalf of its members it is able to offer discounts against market rates of up to 25%.

Source: Co-operative Community Energy, www.cooperativecommunityenergy.com

Developing new forms of financial support

In order to maximise the impact of this approach accompanying financial support packages are likely to be required. There is precedent from North America for the development of mortgage products that take into account reduced overheads – gas and electricity bills – when calculating the mortgage that a customer can repay. This 'stretch' can then be used to finance approved energy efficiency measures or renewable energy technologies.

This approach could be applied in the UK but would require engagement with mortgage providers, and could face resistance because of the already high house prices and high levels of consumer credit.

A variation is already being offered by the Co-operative Bank, which is allowing mortgagees to release equity from repayments – i.e. mature mortgages – in order to refinance carbon reduction measures. This could be applicable for households who have been repaying for a number of years, particularly if they are moving or upgrading to a new property.

Case study: Energy efficient advance, The Co-operative Bank

Consultation with it's mortgage customers the Bank revealed that many wanted to take steps to reduce the CO_2 emissions from their home. As a result the Bank introduced a new loan product designed specifically to fund home improvements that improve energy efficiency and/or to install low carbon energy technologies.

The loan product allows households to release equity from their home in order to finance improvement works of up to £20,000 at 6% APR. The works must be from an approved list of measures, and the Bank has selected a preferred installer called Ecofirst – although customers are not required to use them.

Source: Sarah Pickering (2008) Co-operative Financial Services

RURAL VILLAGES AND MARKET TOWNS

Rural villages and market towns of the kind that can be found in Shropshire, Herefordshire, Worcestershire and Warwickshire create opportunities for small pockets of new housing development on the edges of existing settlements.

Market towns such as Hereford have assembled larger town centre sites, for which higher density 'housing market renewal' or 'urban renaissance' type housing is likely to be more appropriate.

The existing stock of towns, villages and hamlets largely consists of detached and semi-detached property, with trends including the need to provide new affordable housing and, increasingly, farm building conversions for homes and workspace.

Like the suburbs these areas contain some of the region's oldest housing stock, with the greatest heating demand and the lowest SAP ratings, as well as households with the most interest in investing and adding value to their properties.

Heritage concerns may, in some cases, limit the potential for solutions that could affect the external appearance of properties – such as external insulation.

In many locations properties and sites are likely to be off the natural gas grid, requiring the delivery of alternative fuels such as oil and, potentially, biomass.

RURAL VILLAGES AND MARKET TOWNS

Responding to rural housing needs and opportunities

Rural areas of the West Midlands account for around 20% of the regions housing stock, and include some of the oldest and hardest to treat properties, many of which are located off the mains gas grid in smaller villages and hamlets.

In many cases external works may raise heritage concerns, and so innovative solutions are likely to be required to the improvement of the energy efficiency of the rural housing stock.

Niche ecohousing opportunities

New-build schemes on the edge of rural towns and villages create the potential to encourage innovative new housing targeted at more affluent commuters who want to live in the countryside, and are interested in paying more for eco-housing – such as the Wintles in Shropshire developed by Living Villages (see case study below) - or simply a higher quality product – such as Reepham Beck in lincolnshire by Gusto Homes (see accompanying case study report).

Responding to housing needs

Rural communities will tend to have very specific housing needs, particularly for family housing to support young couples on low wages as local property has been bought up my more affluent commuters.

Social landlords such as South Shropshire Housing Association are demonstrating how more energy efficient and low carbon social housing can improve people's lives and reduce fuel poverty.

The cost of construction in rural areas can also be higher, and so leaner construction based on more efficient off-site manufactured timber frame systems can be a solution, enabling costs to be controlled better. Again South Shropshire Housing Association are leading the way in this area, using timber frame systems to control build costs and realise their aspirations to work with specialist regional firms. They have sought to establish a 'carbon forum' to share their knowledge with other RSL's.

Case study: The Wintles, Living Villages

Located on the edge of Bishops Castle in Shopshire The Wintles is the first scheme for specialist developer Living Villages. The company was established by Bob Tomlinson to 'design and build energy efficient, environmentally friendly and socially sustainable new communities'.

The development has proved popular, providing people with the opportunity to 'put their money where their mouth is', and has consistently achieved values some 15-25% above other local new-build completions. It is seen by estate agents very much as a niche product, and people are buying into a lifestyle as much as a home.

Source: Living Villages, www.livingvillages.com

Case study: Rocks Green, South Shropshire Housing Association

Rocks Green is a development of 91 new semi-detached homes in Ludlow, South Shropshire. The development is a mix of 1,2,3 and 4 bed properties. The units are for social renting and shared ownership. All of the homes are to be supplied with their space heating and hot water from communal wood chip boilers installed by Econergy, with heat distributed to each property via 1,200 metres of pre-insulated heating mains.

The development has been estimated to require 200 tonnes of wood chips per year. The fuel is to be supplied under a contract with Midlands Wood Fuel, which was established by Marches Energy Agency. The biomass heating network was part funded by a Rural Regeneration Zone grant.

Source: Econergy, District heating for affordable housing Rocks Green, Shropshire, Newsletter, January 2008

Off-gas grid creates new opportunities

The lack of access to the gas grid in many rural areas creates incentives to develop renewable energy sources when replacement of bottled gas or fuel oil heating systems is required. Biomass is emerging as a new fuel for the rural West Midlands, with biomass heating schemes such as Grange Farm in Hereford and Rocks Green in Shropshire demonstrating the potential, in some case with support from Advantage West Midlands' Rural Regeneration Zone grants.

The supply chain is growing quickly, facilitated by partnership organisations such as Bioenergy West Midlands and commercial organisationssuch as Midlands Wood Fuels, who have been working with biomass heating specialists Econergy on a range of projects.

Case study: Midlands Wood Fuel Ltd

Midlands Wood Fuel was established by the Marches Wood Energy Network, an organisation established to develop the wood fuel supply chain in the West Midlands. The company works with a range of stakeholders, including the Duchy of Cornwall and South Shropshire Housing Association, to provide a complete heating service, from advice and support with boiler installations to the supply of wood chips or pellets to specification. It has established a network of depots to store and dry fuel, and has invested in processing equipment to produce fuel to customers specifications.

Source: Midlands Wood Fuel Ltd (2006) www.wood-fuel.co.uk

4.Bibliography and credits

Background information

Advantage West Midlands (2004) Delivering advantage – the West Midlands economic strategy and action plan, www.advantagewm.co.uk

Department for Communities and Local Government (2001) English House Condition Survey

Department for Communities and Local Government (2006) Review of sustainability of existing buildings, November 2006

Department for Communities and Local Government (2006) Code for sustainable homes – a step change in sustainable home building practice

Department for Communities and Local Government, Strong and prosperous communities – the Local Government White Paper, October 2006

Department for Communities and Local Government, Survey of English Housing 2006/2007

Department for Communities and Local Government, Planning Policy Statement: Planning and Climate Change: Supplement to Planning Policy Statement 1, December 2007

Cyrill Sweet, A cost review of the Code for Sustainable Homes, Report for English Partnerships and the Housing Corporation, February 2007

Energy Efficient Partnership for Homes (2006) Assessment of energy efficiency impact of Building Regulations compliance

Energy Efficient Partnership for Homes (2006) Compliance with Part L1 of the 2002 Building Regulations, Future Energy Solutions

Energy Saving Trust and the Carbon Trust (2004) Community heating for developers and planners, www.est.org.uk/communityenergy

Energy Saving Trust (2007) Generating the future: An analysis of policy interventions to achieve widespread micro-generation penetration

Energy West Midlands (2004) West Midlands regional energy strategy
www.energywm.org.uk

Federal Ministry for environment, nature conservation and nuclear security, The integrated energy and climate change programme of the German Government, December 2007

Government Office for the West Midlands, West Midlands Climate Change Action Plan, December 2007

Housing Corporation and Hastoe Homes, Sustainable Homes – promoting sustainable action in housing, www.sustainablehomes.co.uk

Renewables Advisory Board (2007) The role of on-site energy generation in delivering

Renewable Energy Association (2008) REAL Assurance scheme,
www.realassurance.org.uk

Sponge Network (2007) Ecochic or ecogeek? The desirability of ecohomes, Market research carried out by Ipsos-MORI

University of Oxford (2005) 40% house, Environmental Change Institute

University of Oxford (2007) Home truths: A low carbon strategy to reduce UK housing emissions by 80% by 2050, Environmental Change Institute.

Sustainable Development Commission (2006) Stock take: delivering improvements in existing housing

West Midlands Regional Assembly (2004) West Midlands Regional Strategy, HMSO
www.wmra.gov.uk

West Midlands Regional Assembly (2006) West Midlands Regional Spatial Strategy – Phase Two Revision, Spatial options consultation, www.wmra.gov.uk

Case studies

Bioenergy West Midlands (2008) www.bioenergywm.co.uk

Black Country Housing Group (2007) Changing rooms that don't cost the earth, Eco-renovation project

Bournville Village Trust (2007) Eco-home: A green renovation, Information brochure

British Gas (2008) Green Streets, www.britishgas.co.uk/greenstreets

CAG Consultants, Draft sustainable energy peer support toolkit for local authorities, Contains Cornwall Community Strategy case study, October 2006

Castle Vale HAT (2006) Fact sheet: current and completed projects,

Co-operative Bank (2008) Energy efficient advance www.co-operativebank.co.uk

Co-operative Community Energy (2008) www.ccenergy.com

Econergy, District heating for affordable housing – Rocks Green, Shropshire, Newsletter, January 2008

Midlands Wood Fuel Ltd (2006) www.wood-fuel.co.uk

Nottinghamshire County Council (2008) Ecoteams www.nottinghamshire.gov.uk/home/environment/greenissues/ecoteams.htm

Green Communities Canada (2008) How to grow a Green Community, downloadable from www.gca.ca

Haslam Homes (2007) Showell Park project information sheet

Hestia Services (2008) Grow Your Own Energy, www.growyourownenergy.co.uk

Housing Energy Efficiency Best Practice Programme (2002) Community heating serves luxury private apartments, Good Practice Case Study 400

Living Villages (2006) The Wintles, Promotional brochure, www.livingvillages.com

London Development Agency (2008) Green Homes Concierge service, www.greenhomesconcierge.co.uk

Lowry Renaissance (2006) Titanic Mill sustainable energy measures, www.lowryhomes.com

Malmo Stad (2007) Bo01 An ecological city of tomorrow in the Western Harbour of Malmo, www.ekostaden.se

Manchester City Council and Manchester Methodist Housing Association, Northmoor now – an update report on the concept study, July 2002

MS Architects (2007) The ecohome, Nottingham, www.msarch.co.uk/ecohome

Staffordshire Housing Association (2007) Ecoterrace project, www.ecoterrace.co.uk

Sustainable Energy Academy (2007) Old home, Superhome www.sustainable-energyacademy.org.uk

Severn Wye Energy Agency, Stroud District Council: 40% house feasibility study, September 2007

Worcester News, Wychavon produce eco heat map, 25th October 2007 Archive,worcestershirenews.co.uk/2007/10/25/490218

Wychavon District Council (2007) Wychavon Warmer Homes, www.worcestershire.gov.uk/home/wdc-housing-ps-warmer-homes

Stakeholders and Contacts

SHAP steering group members

Alan Yates, Accord Housing Association (Chair)
Tamsin Hartley, RENEW North Staffordshire
George Marsh, Chase Norton Construction
Julie Alexander, Co2sy
John Horseman, Government for the West Midlands
Ellie Cooper, Hestia Services
Paul Davies, Wates Living Space
Paul Williams, National Housing Federation
Shaun Fielding, Home Builders Federation
Christina Lee, Energy Savings Trust
Randip Singh Bahra, Housing Corporation
Richard Davies, Marches Energy Agency
Adrian Passmore, RegenWM
Ann-Marie Neenan, Black Country Housing Group
Emma Kiteley, West Midlands Regional Assembly
Michael Ciotkowski, Advantage West Midlands
John Sharpe, Sustainability West Midlands
Tony Crompton, Government Office for the West Midlands

Stakeholder workshop: Existing housing stock

Phil Wilson, West Midlands Centre for Constructing Excellence
Steve Forrest, West Midlands Regional Assembly
Phil Brundrett, RENEW North Staffordshire
Mark Evans, Family Housing Association
Andrew Bilbrough, Wychavon District Council
Cynthia Cupido, Birmingham City Council
David Baxendale, North Warwickshire Borough Council
Ian Fergusson, Severn Wye Energy Agency
Fran Bradshaw, Anne Thorne Architects
Gil Schalom, MS Architects
Penney Poyzer, Author and broadcaster
Mark Clemson, New World Solar
Bernie Bailey, Hestia Services
Sarah Pickering, the Co-operative Bank

Stakeholder workshop: New-build housing

Neil Smith, National House Builders Council
Emma Kiteley, West Midlands Regional Assembly
Michael Thompson, West Midlands Centre for Constructing Excellence
Stephen Passmore, Energy Saving Trust
Richard Baines, Black Country Housing Group
Kevin Paddock, Accord Housing Association
Paul Crombie, Housing Corporation
Richard Moore, Haslam Homes
Andrew Webb, Countryside Properties
Paul Davies, Wates Construction
Mark Edwards, Hestia Services

Sustainability West Midlands
Regional Partnership Centre
Albert House
Quay Place
92-93 Edward St
Birmingham B1 2RA

Tel. 0121 449 4406
Email admin@smw.org.uk