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South West Retrofit
Market Analysis Study

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South West Retrofit Market Analysis Study

Project Director: David Kenington

Report Author: David Kenington
John Fawcett
Amanda Bell

Project Team: Richard Carter
Samina Vohra

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Databuild Ltd 21 Graham Street Birmingham B1 3JR
tel 0121 687 1144 fax 0121 687 1155
email research@data-build.co.uk www.data-build.co.uk

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1 Glossary

CERT	Carbon Emissions Reduction Target, which placed legal obligations on larger gas and electricity suppliers to achieve targets for reducing carbon emissions within domestic properties between 2008 and 2012.
CWI	Cavity wall insulation
DECC	Department for Energy and Climate Change
ECO	Energy Companies Obligation, the scheme which replaced CERT in 2013. ECO places legal obligations on the larger energy suppliers to deliver energy efficiency measures to domestic energy users. The scheme is intended to operate alongside the Green Deal which is designed to help people make energy efficiency improvements to buildings by allowing them to pay the costs through their energy bills rather than upfront.
EWI	External Wall Insulation; involves fixing a layer of insulation material to a solid wall, then covering it with a special type of render (plasterwork) or cladding.
GD	Green Deal; A UK Government scheme to help householders finance the cost of energy saving improvements to homes and businesses
IWI	Internal wall insulation
MCS	Microgeneration Certification Scheme; an internationally recognised quality assurance scheme, supported by the Department of Energy and Climate Change. MCS certifies microgeneration technologies used to produce electricity and heat from renewable sources.
Microgeneration	On site, small scale technologies that generate either renewable electricity or renewable heat
PAS 2030	A British Standard Quality Management System commissioned by the Department of Energy and Climate Change. It covers 26 measures and is a requirement for work funded by Green Deal or the Energy Company Obligation.
Private rented sector	The private rented sector in the UK can be defined as any property that is privately owned and being rented out as housing, usually by an individual landlord, but potentially by housing organisations (DCLG).
RDSAP	The Standard Assessment Procedure (SAP) is the methodology used by the Department of Energy & Climate Change (DECC) to assess and compare the energy and environmental performance of dwellings. Its purpose is to provide accurate and reliable assessments of dwelling energy performances that are needed to underpin energy and environmental policy initiatives[1].
RHI	Renewable Heat Incentive; a UK Government scheme set up to encourage uptake of renewable heat technologies among householder, communities and businesses through the provision of financial incentives.

[1] https://www.gov.uk/green-deal-energy-saving-measures/?&gclid=CKGWgtrQ6LYCFVMftAodAl0Ahw

2 Executive Summary

Regen SW, together with the Energy Saving Trust is delivering the Ready for Retrofit programme, a three year European Regional Development Fund (ERDF) programme in the south west of England[2] . The programme aims to accelerate retrofit market growth, assist businesses involved in retrofit to grow and develop competitive advantage, and stimulate longer term growth through targeted demand and supply side development.

To assist in delivery of the programme, Regen SW commissioned Databuild to conduct a market analysis study to better understand the market for retrofit in the south west, including energy efficiency and microrenewable measures and technologies. The objectives of the study were to help understand

1. The scale (number of businesses, number of employees and turnover) of the retrofit market in the South West[3]
2. How the types of organisations along the value chain interact with each other to deliver retrofit projects[4]
3. The barriers to growth in the SW retrofit market
4. The opportunities for growth in the SW retrofit market
5. What can be done to remove barriers to enable more retrofit work to take place

The outputs of the study will help to inform the design of the remainder of the Ready for Retrofit business support programme, inform future retrofit policy and programme design and to generate market intelligence to assist in development of Regen SW's retrofit supply chain directory.

The research was conducted between September and November 2013, prior to Government's proposed changes to the ECO scheme in December 2013.

2.1 Retrofit market scale

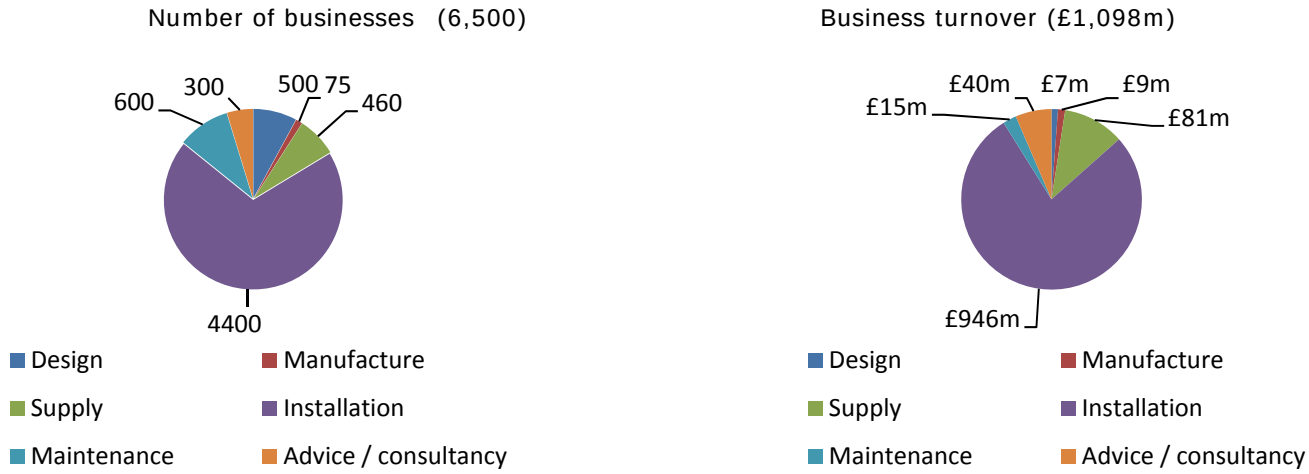
The total size of the retrofit market is estimated as comprising 6,500 businesses supporting, with a turnover of just under £1.1Bn and supporting 16,000 jobs.

[2] Excluding Cornwall and the Scilly Isles. Note the scope of this work includes Cornwall.

[3] Although the Ready for Retrofit programme does not extend to Cornwall, the scope of this study includes Cornwall.

[4] A 'value-chain' represents the various processes involved in producing goods (and services), starting with raw materials and ending with the delivered product.

Figure 1: Number of businesses and proportion of turnover by supply chain stage



It is not possible to make direct comparisons to other regions[5]; however the qualitative research indicates that the retrofit market for:

- Microrenewables (electricity and heat generating) is more developed than other regions, driven by a high proportion of off-gas properties and an historically active supply chain
- Energy efficiency is the same or less developed, hindered by the rurality of the region.

2.2 Market structures and value chains

The retrofit market is heterogeneous, and made up of four market sub-sectors:

1. Traditional energy efficiency
2. Intensive energy efficiency
3. Microrenewable heat
4. Microrenewable electricity.

The majority of retrofit activity operates within these individual sub-sectors, which each have distinct structures, value chains, opportunities and barriers affecting them. These are reported in detail in sections 8, 9, 10 and 11 of this report. There is limited 'multiple measure' or whole house retrofit activity occurring in the market, but where it occurs, each sub-sector is brought together and managed by a central project or contract manager.

Furthermore, within and across sub-sectors the market is made up of organisations which play different roles in delivering retrofit according to which the market can be segmented, including:

1. Retrofit specialists – organisations specialising in delivery of retrofit measures (e.g. microrenewable heat, solid wall insulation), who are actively seeking retrofit business and have relevant skills and accreditations to deliver work
2. 'Active' generalists – businesses not specifically specialised in retrofit work, but actively support delivery, working closely with specialists (E.g. delivering ancillary work required alongside solid wall insulation).
3. 'Passive' generalists – general building contractors and advisers involved in all renovation/building work.

[5] Similar research to this has not been undertaken at a UK level, or in other regions.

As described above, barriers, opportunities and actions affecting each sub-sector are presented in relevant report sections. Only those which affect the whole market are presented below in section 2.3.

2.3 The barriers to retrofit market growth

Demand vs. supply: The market (including customers[6]) reported a sense of '*waiting for the opportunity to be realised*' indicating that action on demand generation would yield the most growth. However, the study found barriers across supply and demand.

Demand barriers: Lack of demand is driven by two key issues:

1. Lack of customer awareness of retrofit; including awareness and understanding of solutions and support available, in particular with regards to uptake amongst vulnerable groups
2. Lack of customer interest; including lack of understanding of benefits, perceived hassle factors and lack of sufficient policy support and confidence in technologies/measures.

A further reported issue is that where demand exists, it is often not as effective as it could be; with few examples of 'whole house' or 'multiple measure' retrofit jobs being completed.

Barriers to supply: Market-wide supply chain barriers are focused around two key issues, which will affect the market increasingly as demand grows:

1. Skills and capacity: The market as a whole is not set up to deliver on the scale needed to deliver 2020 carbon emissions targets. To achieve this would require a step change in capacity and skills. Furthermore, there are existing constraints at current demand levels, which include a lack of specialist skills in the intensive energy efficiency sub-sector, and lack of capacity to deliver microrenewable heat projects at scale. In addition, certifications are a barrier to retrofit activity (PAS 2030, MCS), particularly for small organisations.
2. Effectiveness of retrofit delivery: There is evidence of a lack of a 'joined up' approach to delivering retrofit activity, characterised by a high level of sub-contracting multiple specialists and generalists to deliver retrofit, each delivering a narrow scope of services. This creates challenges in particular for 'multiple measure' projects, which is further exacerbated by a reported lack of project management skills in the south west for this type of work.

2.4 Opportunities for growth in the SW retrofit market

Opportunities to increase demand:

1. Increasing awareness: Take up of previous policies (e.g. CERT) has been lower in the south west than other regions, which means there is more latent opportunity than elsewhere. In addition, there is some evidence of partnership projects (e.g. Devon district councils partnership) which are working to increase the scale of retrofit delivery in the south west through proactively working with energy suppliers, their delivery partners and housing associations. This is a model, which has been successfully delivered in other parts of the UK (e.g. Kirklees) and could be further developed. Finally, there is a very active community energy sector in the south west, reported by recent research undertaken for DECC to inform DECC's Community Energy Strategy[7], which can be a useful route to market.
2. Generating interest: There is a larger proportion of off-gas properties in the south west than in other regions, which provides a more compelling case for retrofit action. Furthermore, within

[6] In the form of social landlords undertaking retrofit work to their housing stock.

[7] Evidenced through recent research for DECC undertaken by Databuild, shortly due to be published alongside the Community Energy Strategy (late January 2014).

the social housing sector there is evidence that social landlords are not taking as much retrofit action as they could be, in particular to take full advantage of the opportunities provided by policies such as ECO, RHI and FIT. Finally, the private rented sector, as in other parts of the UK remains largely untapped with respect to retrofit.

Opportunities to increase supply:

1. Skills and capacity:
   - The south west market has a well-developed supply chain for microrenewewable heat and microrenewable electricity technologies compared to other regions. Continuing to build on this will therefore ensure retrofit activity in the south west is delivered by the local market, and increasingly will supply to other parts of the UK.
   - There is confusion (including some disillusion[8]) in the market, due to lack of understanding of, and confidence in policy support for retrofit, such as ECO and Green Deal. There is therefore an opportunity for increased investment and activity by improving understanding and confidence in the policy landscape.

2. Effectiveness of retrofit delivery:
   - Increasing the extent to which larger retrofit contracts are managed by businesses in the south west. This will increase the value of work within the south west, and also increase the control of activities delivered under those contracts (e.g. sub-contracted installation) being delivered by south west businesses.
   - Building on areas of the south west retrofit market which are well developed (e.g. microrenewable sub-sectors) to increase the range of retrofit services provided to enhance capacity and skills to deliver whole house retrofit, both through in-house services and well developed relationships with other retrofit specialists and generalists providing support work.
   - Local and national data sources, which exist to improve the potential to identify and target retrofit activities[9].

2.5 What can be done to remove barriers to enable more retrofit work to take place

Generating demand: Actions which will help generate demand include:

1. Increasing awareness: *In the short to medium term*
   - *Providing further support for Local Authority and other partnership activities to deliver large scale private sector retrofit activities in the south west. This includes helping them to overcome targeting and engagement barriers, in particular for those in fuel poverty and the vulnerable. In the short term, further action should be taken to understand what form of support would be most useful, and subsequently developing support activities to facilitate growth of existing partnerships and building new ones.*
   - *Working with the south west community energy sector to assist them in the development of activities to target and refer households to available schemes.*
   - *Encouraging the supply chain to work increasingly with local and national groups and campaigns to raise awareness in the market. In particular, supporting national, local Government and third sector supported campaigns would help, as these messages are more trusted.*

[8] Such as due to changes to policies, such as FIT levels in 2012.

[9] For example: Local Authority and social housing stock surveys, Energy Saving Trust home analytics and other tools.

- *Social housing – there would be value in demonstration of existing, successful social housing projects to improve awareness amongst social housing providers.*

In the longer term

- *Private rented sector – there is value in targeting tenants to increase awareness of current opportunities for retrofit (e.g. landlord's energy saving allowance) and proposed regulations to ban renting of F & G EPC rated properties from 2018.*

2. Generating interest: *in the short-medium term*
   - *Influencing Government to improve support and incentives for retrofit, in particular assistance to:*
     i. *Improve householder uptake of Green Deal*
     ii. *Fill gaps in market support, delivered previously under CERT, but which now fall between ECO and Green Deal support.*
   - *Ensuring the focus of existing targeting campaigns is in 'off-gas' parts of the region, where possible, demonstrating the business case provided by retrofit measures and technologies; in particular including incentives which directly provide further support for them (e.g. RHI).*
   - *Social housing – providing further advice to social housing providers to help them take full advantage of policy support, including how best to work with ECO providers and suppliers to obtain maximum value and take more of a 'whole house' approach.*
   - *Building the capacity and skills of the community energy sector to grow their role in actively delivering retrofit activity.*
   - *Increasing market and technology confidence by improving available advice and information support for householders, including*
     i. *Impartial advice and information (e.g. Government backed)*[10]
     ii. *Tools and information to highlight which measures would be appropriate for individual homes / circumstances etc.*
     iii. *Exemplar homes – to showcase measures / technologies in practice.*

In the longer term

- *Private rented sector – furthering work with landlords, in particular those with large portfolios*[11] *to develop retrofit schemes, taking advantage of the landlord energy saving allowance and future-proofing their stock for proposed 2018 legislation.*

Increasing supply:

3. Skills and capacity: *In the short-medium term*
   - *Continuing to provide, and increasing advisory and financial support (e.g. Ready for Retrofit support - including business assist and vouchers). This should particularly focus on smaller businesses, where existing support has potential for greater impact.*
   - *Communication activities with the supply chain (e.g. through supply chain networks) to improve understanding of the opportunities provided by retrofit, policy support, and potential provided by obtaining specific skills (and accreditations) to undertake work. Ensuring both impartiality and independence of information is important to increase trust.*
   - *Undertaking showcase activities to showcase supply chain excellence demonstrated in the south west, such as microrenewables. This will enhance the south west's reputation for delivery and assist increasing activity in other regions.*

[10] There is a known gap in the market for information and advice, since the removal of funding for Energy Saving Trust advice centres in 2012.

[11] Where there is opportunity for larger scale action. Large portfolio landlords also take a more active approach to managing their stock, with regular maintenance programmes, which can provide an opportunity for retrofit activity.

4. Effectiveness of retrofit delivery: *In the short-medium term*
    - *Assist, through advice and training, south west based building contract managers – to help them gain more access to managing retrofit projects; in particular larger contracts which are being won by contractors based outside of the region.*
    - *Develop potential for existing south west based organisations to form consortia to tender for large-scale (e.g. social housing) projects.*
    - *Developing networking activities to facilitate relationship building between retrofit specialists delivering different measures, and supporting generalist organisations.*
    - *Working with ECO providers, Local Authorities and others leading retrofit delivery work to facilitate targeting; such as through the use of data targeting tools.*

    In the longer term
    - *Facilitating the development and training of retrofit specialists to be trained in a wider range of solutions, and to generate in-depth expertise in retrofit measures (where there is currently less expertise) e.g. intensive energy efficiency measures. This includes working with south west based colleges to develop specialist courses and qualifications.*

3 Introduction

3.1 Background

Regen SW is a leading centre of sustainable energy expertise and pioneering project delivery operating in the South West region. Their mission is to enable business, local authorities, community groups, and other organisations to deliver ground-breaking renewable energy and energy efficiency projects with thriving local supply chains.

Together with The Energy Saving Trust, Regen SW are delivering the Ready for Retrofit programme, a three-year ERDF funded project offering a new funding opportunity for social landlords in the South West of England (excluding Cornwall) to improve the energy efficiency of their existing housing stock. The aim of the programme is to grow the local supply chain for low carbon building retrofit by stimulating demand and supporting local SME businesses, in order to create a sustainable domestic energy efficiency and microgeneration sector.

The Ready for Retrofit programme aims to:

- Accelerate retrofit market growth first with, and then without, public subsidy
- Enable businesses involved in retrofit in the South West to grow and develop a competitive advantage as the national market grows in response to Government policy initiatives
- Stimulate greater long-term growth in the South West through targeted demand and supply side sector development.

To assist delivery of the Ready for Retrofit programme, Regen SW commissioned Databuild Research and Solutions Ltd. to conduct an energy efficiency and microgeneration market analysis study to better understand the retrofit market in the South West.

3.2 Objectives of the study

Specifically, Regen SW wish for this study to help understand:

1. The scale (number of businesses, number of employees and turnover) of the retrofit market in the South West[12]
2. How the types of organisations along the value chain interact with each other to deliver retrofit projects[13]
3. The opportunities for growth in the SW retrofit market
4. The barriers to organisations realising opportunities in the retrofit market
5. What can be done to remove barriers to enable more retrofit work to take place?

Regen SW want to use the study:

- To inform design of the remainder of the business support programme to maximise its efficiency
- To help local authorities and other stakeholders who have influence over the South West retrofit market inform their policy and support activities in future
- As a means of generating data that the Ready for Retrofit team can use to compile and publish a supply chain directory.

[12] Although the Ready for Retrofit programme does not extend to Cornwall, this study does include Cornwall.

[13] A 'value-chain' represents the various processes involved in producing goods (and services), starting with raw materials and ending with the delivered product.

4 Methodology

4.1 Scope

It was agreed that the following definition of retrofit would be used for this study:

> ***'The installation of energy efficiency measures or microgeneration technologies on existing domestic properties in the south west region, either individually or as part of a package of multiple measures'.***

The definition of retrofit focused on work to existing domestic properties. Therefore responses and estimates of the size of the population do not include businesses that are involved in commercial retrofit. The scope of the study focused on the measures in Table 1.

The research focused on the stages of the supply chain shown in Figure 2, also segmented into four technology/measure based segments shown in Table 1.

Figure 2: Key stages of the retrofit supply chain

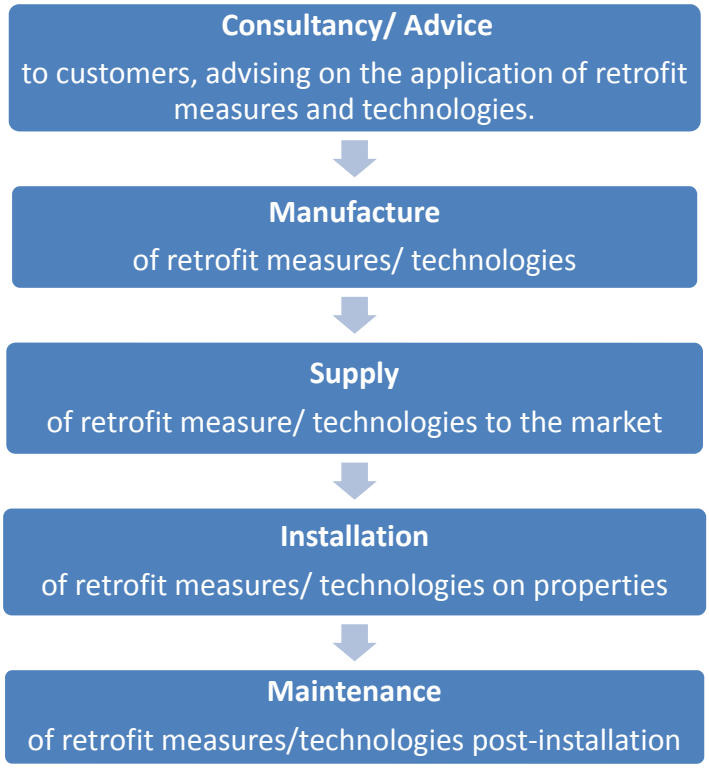


Table 1: Measures and technology segmentation

Microrenewables		*Energy Efficiency*	
Renewable heat technologies (RH)	***Renewable electricity technologies (RE)***	***Intensive energy efficient measures (IEE)***	***Traditional energy efficient measures (TEE)***
Solar Thermal Ground and air source heat pumps Small scale Biomass - <45kW	Micro wind Solar PV Micro-CHP (combined heat and power)	External Wall Insulation (EWI) Internal Wall Insulation (IWI) Fluid cooling systems Heating / power systems Innovative hot water systems Mechanical heat recovery	Cavity wall insulation Loft insulation Floor insulation Condensing boilers Control and monitoring systems Heating controls Energy efficient lighting Voltage optimisation Glazing

Geographic scope: The study focuses on businesses based in the South West region (i.e. they must have a Head Office or branch there) and is not intended to provide findings for other regions or for the whole of the UK.

Inclusion of 'cost effective' insulation measures: It was anticipated that measures such as loft insulation, cavity wall insulation and energy efficient lighting, are already saturated and provide limited opportunity for growth. Therefore the study prioritised the exploration of high opportunity measures and technologies, and captured information relating to cost-effective measures where it was encountered. As such there was more data captured and greater detail provided for some of the more intensive measures, and less detail regarding cost-effective insulation measures.

4.2 Methodology overview

The research was conducted in four stages, each of which are summarised below. It is important to note that the research was conducted from September to November 2013, prior to Government's proposed changes to the ECO scheme in December 2013. Each of the method stages were intended to inform the subsequent stages of the study. The full methodology can be found in Appendix 1.

Stage 1 included a desk based review of existing literature, discussions with the Regen SW business support advisers delivering the Ready for Retrofit programme, and initial qualitative interviews with trade associations.

Stage 2 involved establishing the population of businesses that could be involved in retrofit[14] through examining the Regen SW directory and contacting commercial database providers. Once a business population was established, a quantitative telephone survey of businesses across the South West supply chain was conducted, comprising:

- 151 quantitative telephone interviews with businesses active in the retrofit market
- 95 quantitative telephone interviews with businesses that are inactive in the retrofit market, to understand why they are not involved.

[14] For example installer of external wall insulation, manufacturers of heat pumps, and energy consultants

Interview responses were weighted to allow us to gross up the interview responses to the whole population, where this was possible / appropriate[15]. Information about how the weighting factors were calculated is in the full methodology in Appendix 1.

Stage 3: Further to the quantitative survey, 13 telephone interviews using a semi-structured topic guide were conducted with individuals who could share their insight about the type and scale of opportunities in the South West retrofit market. These include Green Deal and ECO providers, social housing landlords and the Department for Energy and Climate Change.

Stage 4: The results of the quantitative survey and the qualitative interviews conducted in stage 3 suggested two measure areas in particular worthy of further investigation to map the value chains;

- External wall insulation, as an 'indicator' measure of intensive energy efficiency which often includes other measures
- Renewable heat technologies, as an identified area for growth with complex supply chains.

20 qualitative telephone interviews were conducted with businesses across these two supply chains.

The research was conducted in accordance with ISO 20252.

4.3 Analysis

Quantitative and qualitative techniques have been used to analyse the data.

- Estimates of the number of businesses active in the retrofit industry in the south west were calculated by grossing up the results – the calculations are provided in Appendix 1.
- Quantitative analysis has been conducted using IBM SPSS[16] to produce frequencies and cross-tabs to understand trends in the data
- Qualitative data has been analysed through identifying key themes and to support the results from the quantitative analysis.

4.4 Limitations

Sample size: The quantitative survey is based on 151 interviews with businesses that reported to be active in the retrofit market and 95 interviews with businesses that reported they were not active in the retrofit market. Whilst the study tried to cover as many stages of the supply chain and as many measures as possible, low numbers of interviews have been conducted in some of the sub-sectors. It was therefore not possible to provide detailed quantitative analysis for each measure.

Assessing consumer demand: The research was not intended to capture the perspective of householders. To provide an indication of take-up of retrofit measures, and therefore the scale of the retrofit market, existing literature and data have been used where available. Opinions expressed in this research about consumer demand are from the supply chain and stakeholders, which may not accurately reflect the consumer perspective. Additionally, the RSLs engaged in this research were not able to provide an estimate of the amount of money they spend on retrofit activity.

Challenges to estimating the size of the population:
The research was presented with the following challenges when estimating the size of the population of the retrofit market in the south west:

[15] In circumstances where better information was available, such as from existing evidence gathered through the literature review, this was used in the weighting process.
[16] A statistics packages used for statistical analysis of data.

- There is no industrial classification code (SIC) for retrofit activity
- Businesses involved in retrofit are also likely to be involved in other areas of work
- Some businesses are unaware of their involvement in retrofit. 11% of the respondents in the market survey were not aware of their involvement in the retrofit market, and had to be specifically prompted with the definition. Typical businesses unaware of their involvement in retrofit include loft converting businesses, suppliers of biomass fuel, installers of windows, doors and conservatories, and general plumbing and heating engineers covering boiler replacement.

The population estimates were calculated by:

- Taking each of the sub-groups identified in the Thomson classification code
- Identifying the proportion of businesses in the survey that stated they were active and inactive in the retrofit market
- Identifying the proportion of businesses that were found to be out of target sector e.g. their activity was not in relation to construction or energy efficiency activities.
- Grossing up the total number of businesses identified by Experian for each of the sub-groups.

'Value chains' focus: A 'value-chain' represents the various processes involved in producing goods (and services), starting with raw materials and ending with the delivered product. The project focused on the value chains for two key measure areas due to these presenting interesting cases to explore in greater depth:

- External wall insulation (and the required ancillary measures associated)
- Renewable heat technologies.

As a result the value chain sections for IEE and RH are more detailed than RE and TEE. The value chains are based on the qualitative interviews with the supply chain and provide an indication, for each stage of the supply chain, of the proportion of activity delivered within and outside the South West region.

5 Literature review summary

5.1 Background

A review of existing literature was conducted primarily to identify what information is already available to address the following five research objectives:

1. The scale (number of businesses, number of employees and turnover) of the retrofit market in the South West[17]
2. How each of the types of organisations along the value chain interact with each other to deliver retrofit projects[18]
3. The opportunities for growth in the SW retrofit market
4. The barriers to organisations realising opportunities in the retrofit market
5. What can be done to remove barriers to enable more retrofit work to take place?

Through the literature review, knowledge gaps were also identified which enabled the primary research in this study to be focused to address these.

The literature review followed the approach of a rapid evidence assessment. This provides an overview of existing research on a specified topic and collation of the evidence provided by those studies which is limited to answer the points of particular interest, rather than summarising the literature more generally. The review was therefore rigorous and systematic but limited to the research objectives above. This approach was appropriate for identifying existing evidence to direct future research needs.

The sections below provide a summary of the key findings from the literature against each of the five objectives. A full literature review can be found in the Appendix.

5.2 The scale of the retrofit market in the South West

The literature contains some information regarding the size of the south west retrofit market such as the number of employees, GVA and the amount of Green Deal activity in the region. Key points are summarised below.

Market scale: There is very limited information available on the scale of the retrofit market in the south west as previous research has not specifically focussed on retrofit. However, useful information includes:

- The LCGES sector included approximately 4200 businesses, employing 78,000 employees, with building technology sales estimated at £1.2Bn in the south west in 2011/12[19]. This study by BIS was broad in scope, but also does not including many organisations involved in supporting retrofit (e.g. building contractors, ancillary measure installers etc.)
- The south west renewable energy and energy efficiency sectors included approximately 730 businesses, employing 10,000 full time equivalent staff, with a turnover of over

[17] Although the Ready for Retrofit programme does not extend to Cornwall, this study will include Cornwall.
[18] A 'value-chain' represents the various processes involved in producing goods and services, starting with raw materials and ending with the delivered product.
[19] Department for Business, Innovation and Skills, *Low Carbon Environmental Goods & Services (LCEGS) Reports* (2010/11) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/224068/bis-13-p143-low-carbon-and-environmental-goods-and-services-report-2011-12.pdf

£400m in 2010[20]. The scope of this study (by DTZ) was narrow (i.e. focused on specialist businesses) and did not focus specifically on retrofit activity.

Due to the limitations of both studies with regards to defining retrofit, and the rapidly evolving nature of the sector[21], these numbers can only be used to provide a broad sense of scale.

Market activity: There appears to be more retrofit activity involving traditional energy efficiency measures and microrenewable technologies than intensive energy efficiency.

5.3 How the supply chain interacts to deliver retrofit work

The review found information relating to different sub-sectors of the retrofit market, as summarised below.

Market structures:

- Sub-sector differences: The retrofit market, its supply chains, opportunities and barriers are different between different retrofit measures and technologies (e.g. renewable heat vs. energy efficiency). This is due to significant differences in customer demand, supporting policies, and supply chain needs (e.g. skills and capacity) between these. These differences mean it made sense to segment the research by sub-sector. The review confirmed that a sensible sub-sector split is across:
  - Energy efficiency – split between traditional and intensive measures
  - Microrenewables – split between renewable heat and electricity.
- Multiple measure delivery: Notwithstanding the above, retrofit often involves design, supply and installation of multiple measures on each property / work scheme, with policies increasingly designed to support this to take advantage of efficiencies presented by this approach. As a result, the market should also be considered as a whole, as well as by sub-sector.
- Supply chain involvement in retrofit: Within and across sub-sectors there are many different organisations, both within and outside of the south west, involved in the delivery of retrofit. There is significant heterogeneity in roles and the extent to which organisations are involved in retrofit, which should be included within the design of the research. Examples of this heterogeneity includes:
  - Retrofit specialists – organisations, which are set up and work specifically to deliver retrofit work as part of their core business model (e.g. microrenewable installation businesses)
  - Retrofit support organisations (e.g. those delivering ancillary measures and support work, such as rendering and plastering for solid wall insulation work) and generalists (e.g. project managers, designers and advisors) who get involved with retrofit as part of wider schemes of works.
- Retrofit delivery in the south west: There is some evidence to suggest that a significant proportion of retrofit work in the south west is delivered by organisations based locally, and that there is also some export of products and services outside of the region. Aspects of retrofit, which are more likely to be supplied or delivered by organisations outside of the region include manufacture (and in some cases also supply) of measures and technologies, and overall management of large scale

[20] DTZ (for Regen SW), *The Economic Contribution of the Renewable Energy and Energy Efficiency Sectors in the South West of England* (2008; updated 2009) http://regensw.s3.amazonaws.com/1282046376_675.pdf
[21] The DTZ study found that the renewable energy sector grew over six-fold between 2005 and 2008.

contracted works. Aspects more likely to be delivered locally include advice, design and, most significantly, the installation of retrofit measures and ancillary works.

5.4 The opportunities for growth in the retrofit market

There is some information on market opportunities reported by a number of studies and further informed by the initial qualitative research. This included:

- The south west has the most inefficient housing stock in England, but is well suited to application of energy efficiency and microrenewable measures.
- Some aspects of the supply chain appear to be well developed, for example installation works for specific sub-sectors (e.g. renewable energy and traditional energy efficiency), which can be built on.
- The development of the retrofit market provides a significant job creation opportunity for the south west, in particular for skilled and ancillary trades (E.g. plumbers, electricians, insulation installers etc.)
- National policies such as RHI, FIT, ECO and the Green Deal provide excellent opportunities for growth within sub-sectors and across the sector as a whole.

5.5 The barriers to realising growth in the retrofit market

Barriers are widely cited in the literature. Key points include:

- Some specific stages of the supply chain are less well developed, including manufacturing and supply
- Some large retrofit contracts are going outside of the region
- Some sub-sectors are less well developed than others – e.g. intensive energy efficiency, where there is a lack of skills and capacity in the south west
- There appears to be a lack of multi-skilled contractors able to deliver more than one retrofit measure
- Supporting policies not providing the support or market certainty required for continued market growth. Specific issues include:
    - Lack of customer awareness raising to increase demand
    - Lack of transition planning between major schemes (E.g. CERT and CESP to ECO and Green Deal) leading to large fluctuations in demand and uncertainty
    - Perceived onerous accreditation requirements e.g. MCS, PAS2030 to qualify to undertake retrofit work
    - Specific issues in parts of the market, such as tenant / landlord split incentives in the private rented sector[22].
- Lack of customer demand, in particular for some retrofit measures (e.g. intensive energy efficiency). Reported issues affecting demand include:
    - Lack of trusted information and advice
    - Perceived, or real hidden costs associated with retrofit (e.g. ancillary works)

[22] DCLG define the private rented sector in the UK can be defined as any property that is privately owned and being rented out as housing, usually by an individual landlord, but potentially by housing organisations.

5.6 The support required to overcome barriers in the retrofit market

Financial support was the predominant recommendation from the literature review, in terms of increasing both supply and demand. In helping customers afford retrofit measures and in helping businesses, accreditation schemes are considered to be too expensive and inaccessible, and financial support is seen as a way to overcome this barrier. For consumers, the upfront costs of retrofit work are thought to be too high and payback periods too long, and therefore financial mechanisms to alleviate these issues are suggested to increase demand in the retrofit market.

5.7 Knowledge gaps

Whilst the summary of the information above provides a useful start in addressing the research objectives, there are key gaps which need to be addressed in this study. These include:

1. Developing a good understanding of the scale of the market specific to retrofit and each sub-sector (e.g. renewables, energy efficiency) within it.
2. Developing further understanding of the roles and responsibilities of different stages of the supply chain, including value chains.
3. The barriers and opportunities, and actions, which would support development of the market, both at a market-wide and sub-sector level.

6 Report structure

Supported by the literature review findings, the research found that the retrofit market is characterised by a few large businesses and a much larger number of smaller businesses, which deliver the majority of retrofit work. Organisations within the market tend to specialise in the design and delivery of specific retrofit measures (e.g. renewable heat measures, traditional energy efficiency etc.). There is evidence of 'multiple-measure' retrofit activities being undertaken on projects (i.e. whole house retrofit) and delivery is characterised by project or contract managers sub-contracting significant aspects of work to multiple specialists to deliver each measure, alongside supporting ancillary works, delivered by generalists such as building contractors. There are significant differences between businesses which have specialised, specifically in retrofit activities and those which deliver supporting work, which means that a market segmentation has been applied to describe this (section 7.2).

Furthermore, retrofit market activity is highly specialised between measure / technology sub-sectors. For example, the market structures, customer demand profile and delivery activities of traditional energy efficiency measures differs significantly from renewable heat or electricity technologies. In essence, the retrofit market is made up of a series of sub-sectors, which come together to deliver retrofit work according to customer demand. Each sub-sector is at a different point in terms of its market development, and consequently has different value chains, opportunities and barriers to market growth.

The report therefore takes a sub-sector specific focus in order to reflect these differences and provide granular insights to inform opportunities and barriers which affect the market. The report is structured as follows:

- Market overview and segmentation (section 7.1, 7.2)
- Sub-sector market analysis, including structures, value chains, barriers and opportunities for growth for the sub-sectors described in:
    - Intensive energy efficiency (section 8)
    - Microrenewable electricity (section 9)
    - Traditional energy efficiency (section 10)

- Microrenewable heat (section 11)

Through this process, conclusions can be made about barriers and opportunities, which affect the market as a whole, which are reported in section 12.

7 Scale of the retrofit market in the south west

7.1 Market overview

The results of the study estimate there to be approximately 6500 businesses *involved in generating revenue in the retrofit market to varying degrees* in the south west region. These businesses generate a turnover related to retrofit activities of approximately £1,098 million per annum and employ 16,000 people[23].

Figure 3: Number of businesses and proportion of turnover by supply chain stage

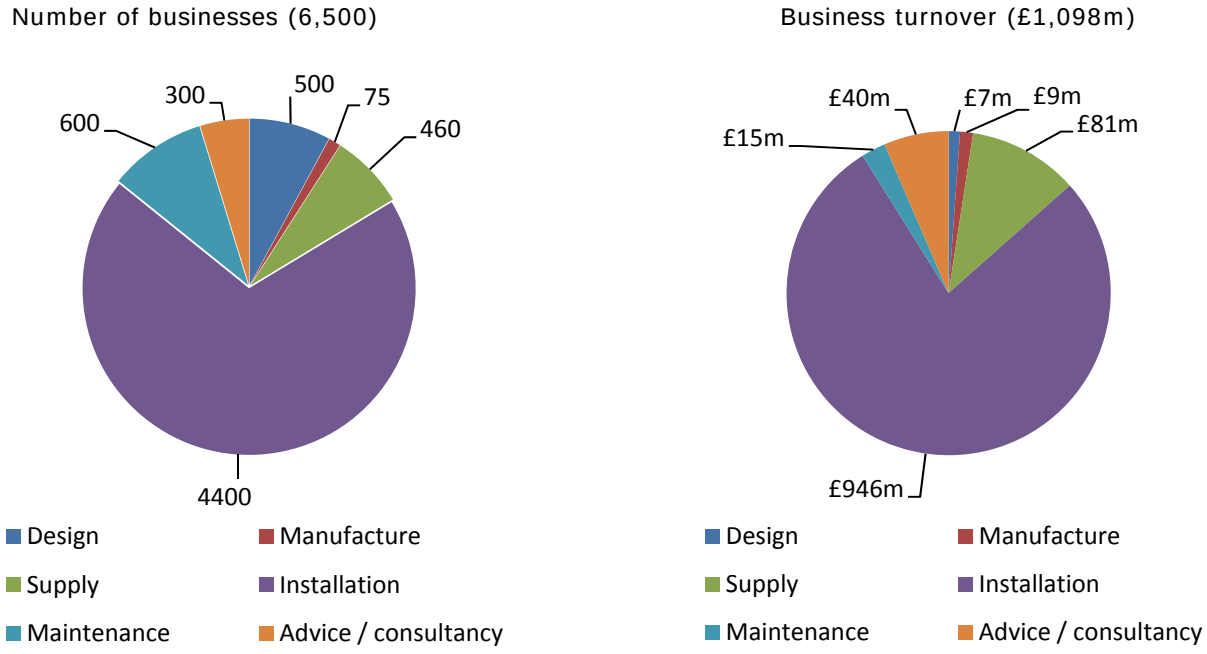
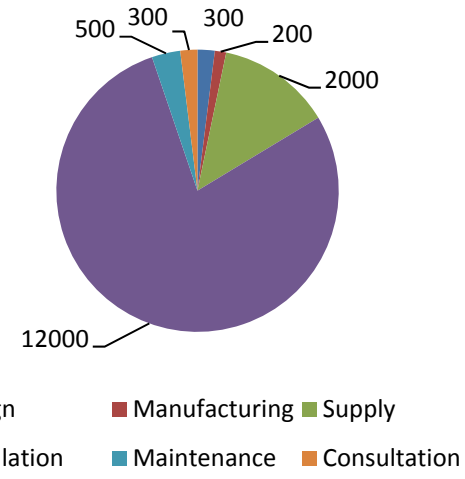


Figure 4: Number of employees at each stage of the supply chain (Total 16,000)



[23] These estimates are based on results from the study methodology. See Appendix for details.

Of the businesses involved in domestic retrofit in the south west, the largest supply chain stage (in terms of number of businesses and turnover generated) is installation. There are estimated to be 4,400 (68%) businesses involved in the installation of retrofit measures and technologies, which generates approximately £946 million turnover and employs 12,000 people. The next largest stage is that of supply, which accounts for approximately 460 businesses and £81 million turnover. Manufacturing, design, maintenance and advice / consultancy stages represent the smallest proportions of businesses and turnover generated with a combined number of 1,475 (23%) of businesses and £71 million turnover per annum.

Where possible, the main activity of businesses was categorised as either energy efficiency or microrenewable. Table 2 summarises the number of businesses, turnover generated and number of employees that are specifically involved in the delivery of either energy efficiency or microrenewable retrofit work. These are typically businesses that generate at least 25% of their turnover through retrofit activity and tend to specialise in one particular sub-sector.[24] There are approximately a further 2000 businesses that are often involved in delivering both energy efficiency and microrenewable work, of which it was not possible to quantify their level of involvement in each – therefore this activity is not included within Table 1Table 2. This group of businesses are typically architects and general building contractors who often get involved in the delivery of a wide range of retrofit measures spanning all sub-sectors.

Table 2: Summary of data specific to the energy efficiency and microrenewable sectors

	Energy Efficiency	Microrenewables
Number of businesses	3000	1500
Turnover	£450 million	£850 million
Number of employees	8500	2500

This study found that GVA represents 47% of the turnover generated by the retrofit market in the South West, which is equivalent to approximately £500million. This compares to statistics within the ONS Annual Business Survey[25] that suggests on average gross value added is 48% for the service sector and 38% for the construction sector. The £500million gross value added estimated in this study compares to existing research that suggests that in 2008, the South West as a whole generated £98 billion gross value added.[26]

7.1.1 Profile of businesses active in the retrofit market

Respondents reported to have been involved in retrofit work for an average of 11 years[27] (range 0.5 to 40 years). Reasons for commencing retrofit activity are shown in Figure 5, of which the most commonly cited reasons include customer demand, and retrofit presenting an opportunity to open up new revenue streams.

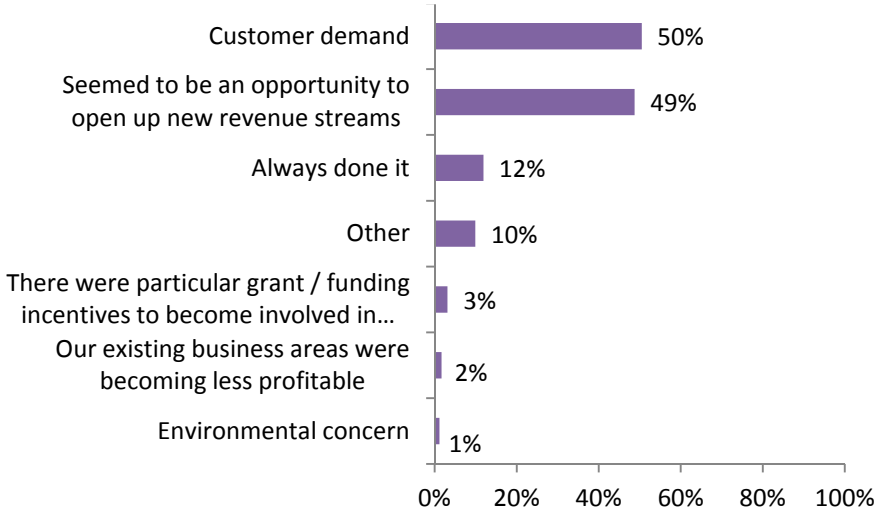
[24] These businesses are defined as Retrofit Specialists and Active Generalists which are discussed in more detail in section 7.2.

[25] http://www.ons.gov.uk/ons/dcp171778_266774.pdf

[26] http://www.ons.gov.uk/ons/regional-statistics/region.html?region=South+West

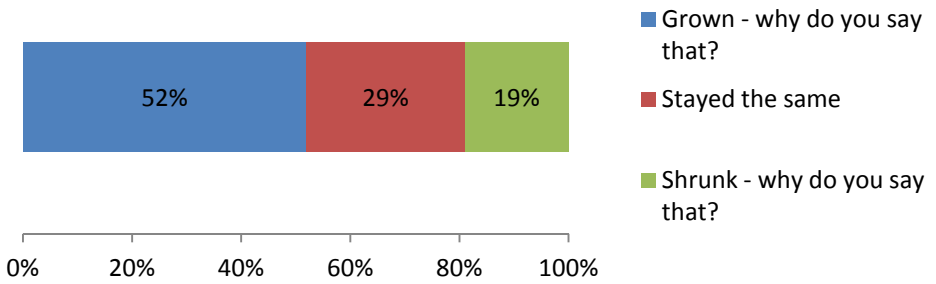
[27] Based on a 5% trimmed mean

Figure 5: Reasons for entering the retrofit market (n=150) (Multiple response)



Opportunities for growth: Since entering the retrofit market, just over half (52%) of businesses reported that opportunities for work in the retrofit market have grown, 30% reported it staying the same, and 18% felt that opportunities had shrunk.

Figure 6: Since you entered the retrofit market do you feel that opportunities for work in the retrofit market have grown, shrunk or stayed the same? (n=150)



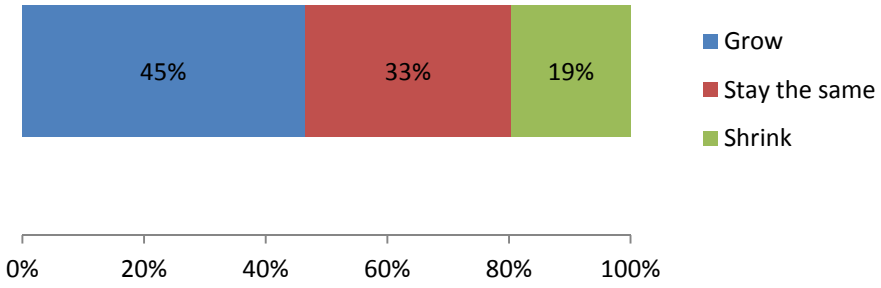
Further to this, almost half of businesses (45%) expect their retrofit related turnover to grow over the next 12 months, 33% expect it to stay the same and the final 19% expect it to decrease. Reasons for growth reported by respondents include:

- The availability of funding to support the cost e.g. the FIT
- Owner occupiers are choosing not to move house and instead make improvements to their existing home which sometimes require / include energy efficiency improvements.
- Increasing energy bills are encouraging people to invest in energy efficiency improvements
- The cost of some technologies / measures have become more affordable over time increasing the size of the potential market

Reasons for a declining market cited by respondents include:

- Changes to funding (e.g. FiT) have made people reluctant to invest
- A general deceleration in the economy meant that there was less construction work taking place overall
- Market saturation and increasing competition

Figure 7: Do you expect your retrofit turnover to grow, stay the same or shrink in the next 12 months? (n=150)



Reasons for expected growth cited by respondents include:

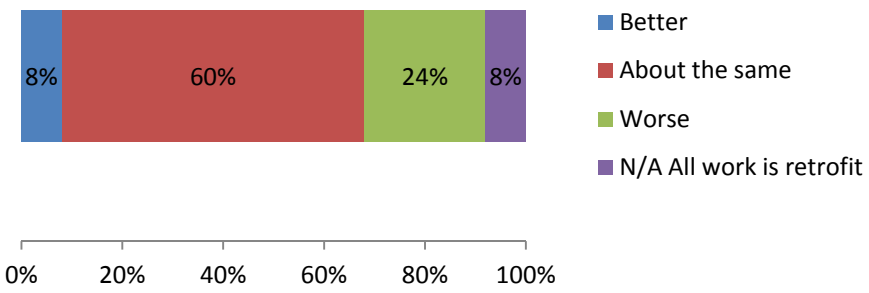
- People continuing to improve their existing home rather than move, which may influence some energy efficiency improvements
- Businesses increasing their marketing activity to more proactively pursue growth through new customers
- Government incentives such as the launch of the domestic RHI in Spring 2014
- A general improvement in the UK economy means people are beginning to spend.

Reasons for an expected decrease in turnover, cited by respondents include:

- Businesses choosing to exit the market completely for personal reasons e.g. retiring or emigrating
- Less confidence in the market about retrofit work; people are holding off waiting for the cost of measures to reduce or for advancements in technology that may provide higher performance
- Businesses are choosing to more proactively pursue other activities, such as new build work, as it is deemed to be easier work and / or more profitable

Profitability: On average respondents reported that over the last 12 months their profit margin on retrofit related work was 18%, although responses varied from 0% to 80%. 60% of respondents reported that the profit margin they made on retrofit work was about the same as non-retrofit activities, 8% reported that the profit margin was better and 24% reported that their profit margin was worse, as shown in the Figure below.

Figure 8: How does the profit margin on retrofit work compare to the profit margin on non-retrofit activity? (n=150)



7.2 Market segmentation analysis

The market figures presented encapsulate all organisations with some involvement in retrofit, including specialists (e.g. those specialising in the installation of retrofit measures) and businesses undertaking generalist work to support retrofit works (e.g. delivering ancillary measures). The literature review and qualitative research showed that the extent to which businesses are involved in retrofit varies significantly across the market and this affects key aspects of organisational activity, such as:

- Activity type – such as leading the delivery of retrofit work, or providing support work[28] and whether or not the organisation possesses specific certifications and specialist in-house staff
- Activity scale – retrofit activities being conducted on a large or small scale and / or is a major / minor part the organisation's overall activities.

As a result, the market was segmented into the following groups for analysis purposes:

1. **Retrofit specialists;** businesses generating at least 50% of their turnover through retrofit activity and have relevant accreditations such as certification to the Microgeneration Certification Scheme or PAS[29] 2030.
2. **Active generalists;** businesses generating a lower proportion (25% to 50%) of turnover through retrofit activity, without specific accreditations. These businesses are considered to be 'active generalists' because they perform activities related to specific retrofit sub-sectors[30] either directly delivering work (e.g. smaller scale solid wall insulation as part of a wider job) or conducting supporting ancillary work (e.g. roofing and guttering work to support external wall insulation).
3. **Passive generalists;** businesses with minor involvement in retrofit (<25% of turnover) spanning across all measure sub-sectors

[28] Such as ancillary measures (e.g. roofing and plastering) for intensive energy efficiency measures such as external wall insulation.
[29] Publicly Available Specification.
[30] Intensive energy efficiency, traditional energy efficiency, renewable electricity and renewable heat

Figure 9 below shows the number of businesses and turnover generated through retrofit activities for each market segment.

Figure 9: Number of business and turnover by market segment

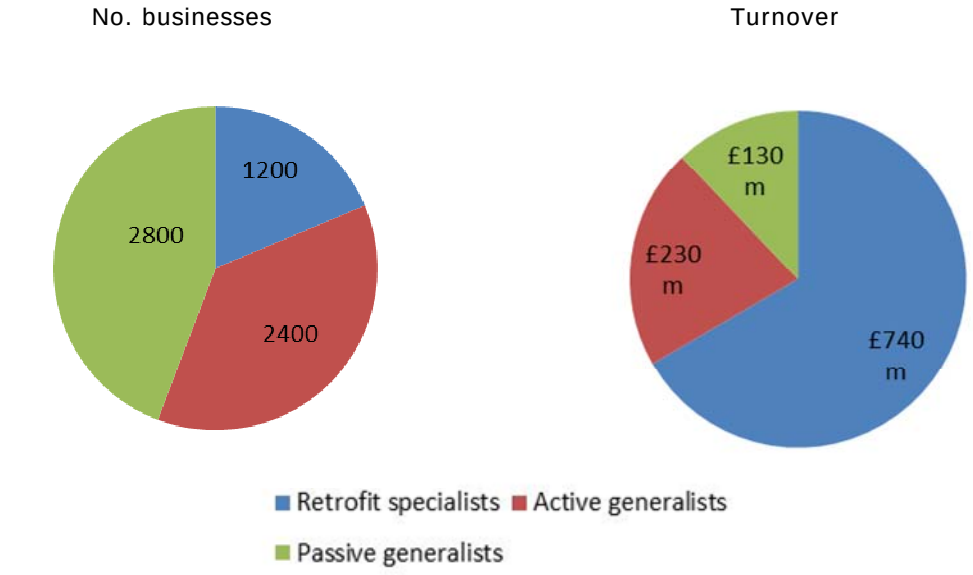


Figure 10: Number of employees by market segment

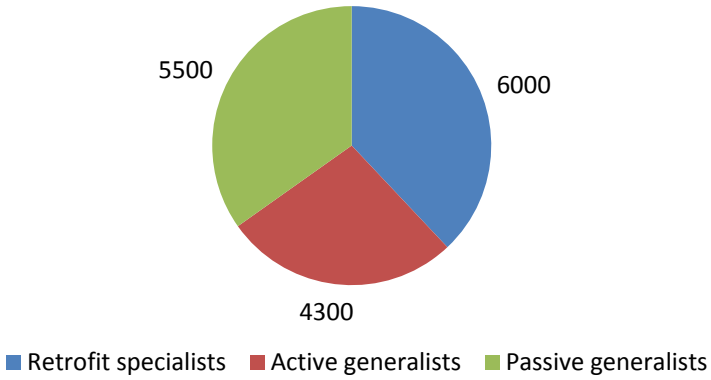


Figure 11: Involvement in different stages of the supply chain by market segment

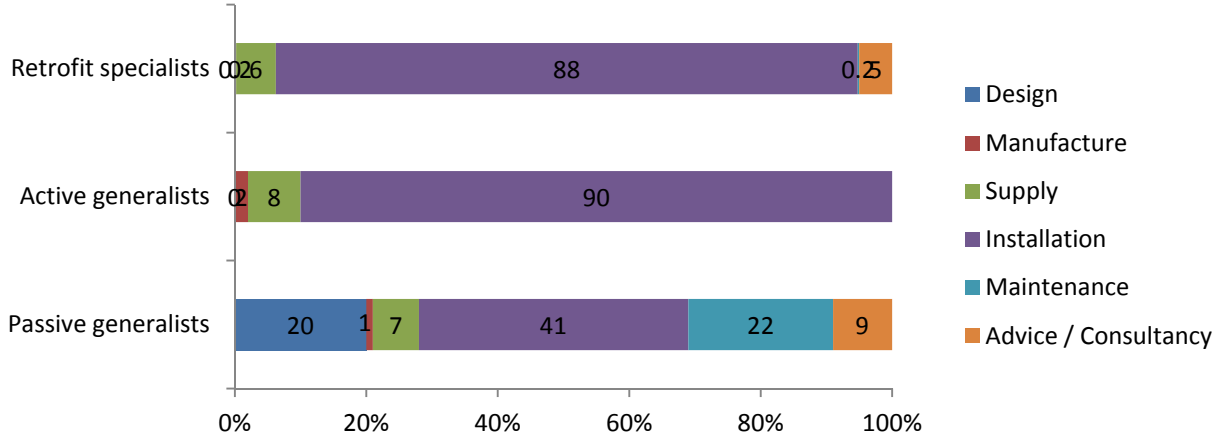


Table 3 shows a further breakdown of turnover by stage of supply chain for each market segment.

Table 3: No. businesses and turnover by stage of the supply chain

Segment	Supply chain stage	Design	Manufacture	Supply	Installation	Maintenance	Advice / Consultancy
Retrofit specialists	No. businesses	0	1	75	1057	1	71
	Turnover	-	£1.25m	£22m	£682m	£0.2m	£28m
	No. Employees	-	5	88	5406	3	214
Active generalists	No. businesses	0	42	198	2163	0	0
	Turnover	-	£4.6m	£14m	£215m	-	-
	No. Employees	-	178	143	4026	-	-
Passive generalists	No. businesses	589	32	190	1181	624	242
	Turnover	£7.5m	£4m	£45m	£50m	£15m	£12m
	No. Employees	298	32	1848	2697	545	108

Further details of the scale, types of activities and retrofit market prospects for each market segment are provided in the sub-sections below.

7.2.1 Retrofit specialists

Scale: The retrofit specialist segment includes 1,200 businesses (18% of the market), generating an annual turnover of approximately £1,012 million[31] (67% of the total market) and employing 6,000 people. The average retrofit specialist employs five people directly relating to retrofit work and has an average turnover of £843k per annum (£609k related to retrofit).

Activities: As shown in Figure 11, 88% of the group are installers and of these, 94% claim to have some involvement in installation of traditional energy efficiency measures, 70% renewable heat measures, 32% renewable electricity measures and 24% install intensive energy efficiency measures[32]. There are overlaps between sub-sectors as respondents were requested to include all areas where they undertook some activity, so this reflects the breadth of organisational activity but does not provide detail on the extent to which organisations specialised in each (this is explored in further detail through the qualitative research in the sub-sectors sections 8, 9, 10 and 11). The

[31] Refer to calculation in Appendix 1.
[32] Question presented as a multi-code question, so respondents could state involvement in more than one measure/technology sub-sector.

remaining businesses are made up of suppliers (6%), mainly focused on supply of microrenewables and advisors/consultants (5%). Finally, there are also a very small proportion of manufacturers (0.2%) and maintenance companies (0.2%).

Retrofit specialist installation businesses tend to lead the delivery (and often specific design, and maintenance of the installation) and possess trained specialist staff with relevant certifications to undertake professional works. For example intensive energy efficiency installers have PAS 2030 and microrenewable installers have MCS accreditation. They are actively seeking out retrofit work and engaging with customers and contractors in order to do it. Retrofit specialists tend to be 'in tune' with policy developments in the retrofit market as they tend to affect their businesses more directly than the rest of the market. These businesses are well aware of, and seek to influence (e.g. through trade associations), Government policy.

As described above, across the market there is evidence of sub-contracting multiple specialists with expertise in individual measures, where works involve multiple measures.

Across the market, specialists in different sub-sectors are more or less developed than others in the south west, with respect to the rest of the UK. For example:

- The micro renewables market is more developed than elsewhere for both renewable heat and renewable electricity. This appears to be as a result of factors such as an active supply chain and customer demand, driven by the high proportion of off gas grid properties
- The intensive energy efficiency market is less well developed, which is similarly reflected across the UK
- Activity in the traditional energy efficiency market has reduced significantly in 2013 due to policy changes, mainly driven by the replacement of CERT with ECO and Green Deal.

These are each explored in turn within the sub-sector sections (sections 8, 9, 10, 11), but across the market means that there is different supply chain potential for each sub-sector within retrofit.

Retrofit market prospects: Three quarters (72%) of this group believe that the turnover generated from retrofit work will grow in the next 12 months, with the remainder expecting it would stay the same. The qualitative research shows that specialists are significantly affected by developments in national policy, which affects sub-sectors differently, for example:

- Prospects for renewable heat are felt to be positive, affected by demand created by the RHPP to date and by the prospect of the domestic RHI launch in spring 2014.
- Prospects for energy efficiency (both intensive and traditional measures) is less positive, although greater demand is expected across intensive energy efficiency in particular in 2014 and beyond due to ECO. The market for TEE has decreased significantly in the last year due to the cessation of CERT and lack of uptake through the Green Deal, but is also expected to recover to some extent in the next two years.

7.2.2 Active generalists

Scale: The active generalist segment includes 2,400 businesses (37% of market), generating an annual turnover of £230m (21% of market) and employing 4,500 employees. The average business employs 2 people directly relating to retrofit activity and has a turnover of approximately £230k per annum (£117k directly relating to retrofit).

Activities: As shown in Figure 11, 90% of this group are installers, although this is less likely to be a core activity compared to the specialist group and therefore have fewer specific accreditations to

undertake retrofit work[33]. Of these, 99% claim to have some involvement in the installation of traditional energy efficiency measures, 62% renewable heat measures, 37% renewable electricity measures and 41% install intensive energy efficiency measures[34].

As with specialists, there is significant variation in how active generalists support the market, which includes:

- Leading and delivering installations – in particular retrofit measures which require fewer specialist skills and accreditations, such as traditional energy efficiency measures and renewable electricity measures such as PV
- Building contractors with a specific focus on managing the installation of multiple retrofit measures on larger scale, multiple property) projects, working with specialist sub-contractors
- Undertaking ancillary and support work specific to measures. For example render and plastering, for solid wall insulation measures, or bracketing, plumbing and electrics for microrenewables installations.

Overall, this group is more likely to undertake work in other areas, including other sub-sectors of retrofit or other work outside of retrofit (e.g. building contractor work), but are actively interested in the development of the market as it bring value to their business.

Retrofit market prospects: Approximately one third of active generalists expect the turnover they generate from retrofit activity to grow in the next 12 months, one third suggested it would stay the same and one third stated that their retrofit turnover would decrease. The qualitative research indicates that this group is affected by Government policy, but to a lesser extent than specialists and therefore prospects may be affected by this.

7.2.3 Passive generalists

Scale: The passive generalist segment includes 2,800 businesses (44% of market), generating an annual turnover of £130m (12% of market) and employing an average of 5,500 employees. The average business employs one person directly relating to retrofit activity and has a turnover of £290k per annum (£45k of which directly relates to retrofit activity).

Activities: As shown in Figure 11, the group includes a variety of groups including non-specialist installers, such as general building contractors (41%) and maintenance contractors (22%), designers (20% e.g. architects), advisors and consultancies (9%) and suppliers (7%, e.g. builders merchants).

Of these, 98% are involved in the installation of traditional energy efficiency measures, 24% renewable heat measures, 37% renewable electricity measures and 29% install intensive energy efficiency measures.

This group has less of a significant role overall in terms of retrofit activity, but plays a number of important roles in the supply chain, such as

- Provision of advice and guidance (e.g. consultants and architects) to clients, which can affect demand for retrofit measures
- General building contractors – who also can create demand through encouraging uptake of retrofit as part of building jobs

[33] There is also likelihood that this work is offered by respondents, but actually sub-contracted out to other organisations for actual delivery.
[34] Question presented as a multi-code question, so respondents could state involvement in more than one measure/technology sub-sector.

- Maintenance – once retrofit measures have been installed, generalist maintenance companies are likely to be the first port of call for maintenance issues
- Supply – providing the link between retrofit manufacturers and the market.

Retrofit market prospects: Nearly half (46%) of businesses in this group stated that they expect their retrofit turnover to increase in the next 12 months, 37% felt that it would stay the same and the final 17% thought it would decrease.

8 Analysis of intensive energy efficiency (IEE) sub sector

This section provides an analysis of the intensive energy efficiency (IEE) sub-sector of the retrofit market, including value chains for both private and social housing markets. This includes activity relating to the following measures and technologies:

- External Wall Insulation
- Internal Wall Insulation
- Fluid cooling systems
- Heating / power systems
- Innovative hot water systems
- Mechanical heat recovery.

8.1 Sub-sector overview

The table below summarises the key findings from the study specific to the Intensive Energy Efficiency sub-sector, which are explored in more detail in the sections below. The figures are based on the retrofit specialists and active generalist groups only.

Table 4: Overview of IEE sub-sector

Number of businesses	415
Turnover	£145million
Number of employees (involved in retrofit)	400
Skills	Specialist technical skills required to install measures such as EWI, although there is potential for trades such as plastering to upgrade skills to conduct EWI work. There is also a skills gap in the ability to manage large social housing contracts. Accreditations: PAS 2030

8.2 Scale of the intensive energy efficiency supply chain in the south west

Retrofit specialists: There are estimated to be 59 specialist businesses working in the intensive energy efficiency supply chain, of which all but one focus on installation of insulation measures[35]. These are specialist businesses, who tend to have the necessary accreditation/ certifications (e.g. PAS 2030) to install measures funded by policies such as the Energy Companies Obligation (ECO) or Green Deal.

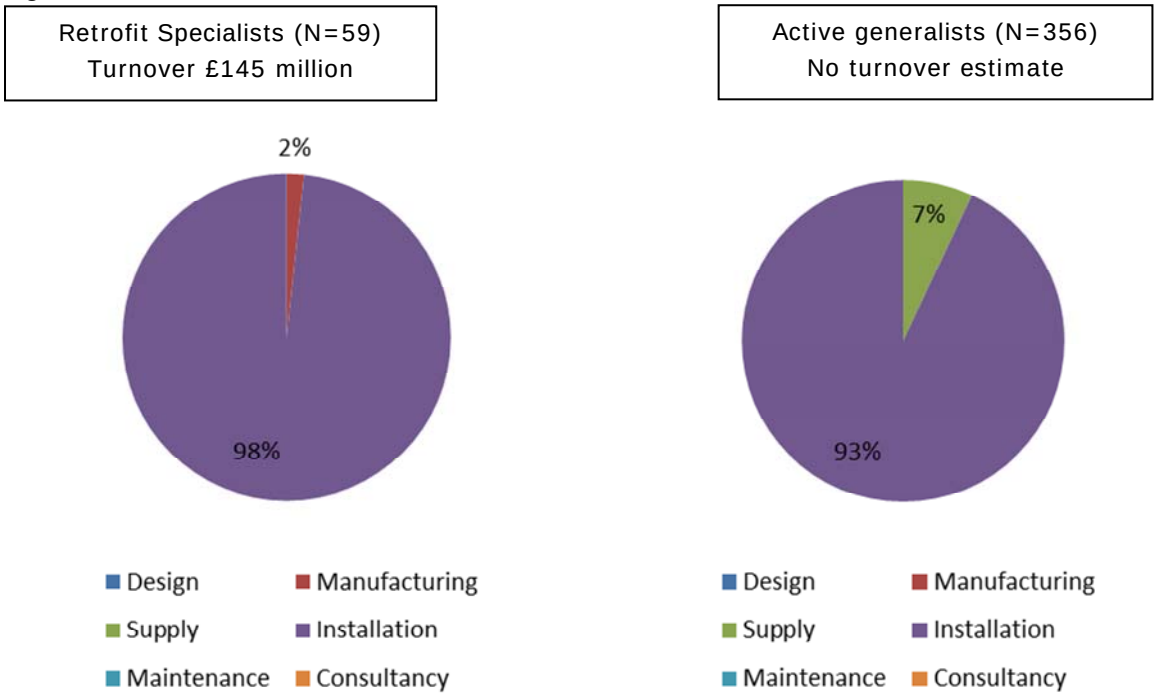
Active generalists: There are a further 356 sub-sector generalist businesses working within the subsector, 90% of whom are involved in installation. This includes supporting trades such as plastering, roofing and guttering who conduct ancillary work as part of EWI installation[36]. The group also includes builders and plasterers, which are undertaking some small-scale EWI installation as part of other building or renovation works, and doing so without accreditation[37]. The remaining 10% of the

[35] The one other business is a manufacturer of render to support external wall insulation.
[36] Whilst the quantitative results do not enable a split between these various trades, Experian estimate there to be approximately 600 plasterers in the south west and approximately 800 roofers within the region. It is not possible to estimate how many are involved in retrofit work.
[37] Informed by the qualitative research.

businesses in the group are suppliers. This group of businesses are typically merchants that have a focus on intensive energy efficiency products, mainly different forms of insulation.

Passive generalists: There are also 29% of passive generalists who identify themselves as undertaking some activity to support IEE measures. This includes architects that include IEE measures into the design of wider property improvement work and building contractors that manage general building work but who sub-contract specialist IEE work to accredited installers.

Figure 12: Number and turnover of retrofit specialist IEE businesses working at supply chain stages



8.3 Intensive energy efficiency value chain analysis

The study findings were used to provide an analysis of the value chain for the intensive energy efficiency supply chain, informed mainly by the qualitative research[38].

The two main markets where retrofit activity is occurring are within the social housing and private owner occupier markets, and as each operate in different ways, separate value chain diagrams have been produced for each sub-sector.

The turnover specific to the Intensive Energy Efficiency sector is estimated to be £145 million[39]. Although it was not possible to accurately quantify the scale of retrofit activity between the private and social housing sectors through the research, the qualitative research clearly indicated that the largest proportion of activity is currently within social housing. This is due to the nature of social housing funding, their existing obligation to provide efficient housing to their tenants[40] and the scale of the retrofit scheme they are able to offer to utilities offering ECO. The private sector is smaller due to the

[38] Due to the small scale of the market and nature of the value chains analysis.
[39] Although this is only based on retrofit specialists at the installer stage of the supply chain, so turnover is likely to be higher but it was not possible to estimate the value due to small sample sizes.
[40] Through the decent homes standard.

recent limited uptake of Green Deal measures, accessibility of ECO and consumer knowledge of funding available through Green Deal and ECO. These aspects are discussed in greater detail below.

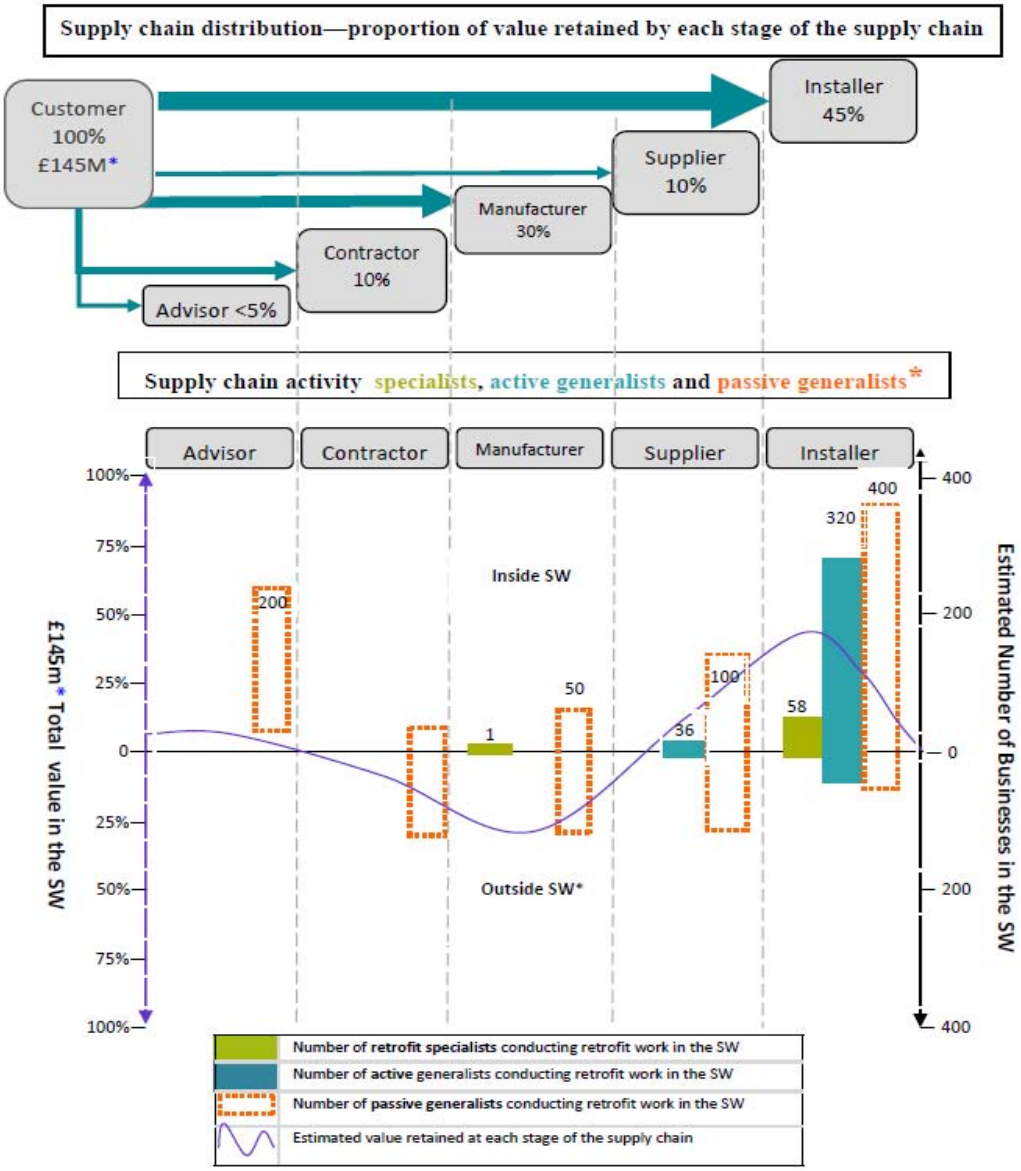
The value chains are each made up of three diagrams:

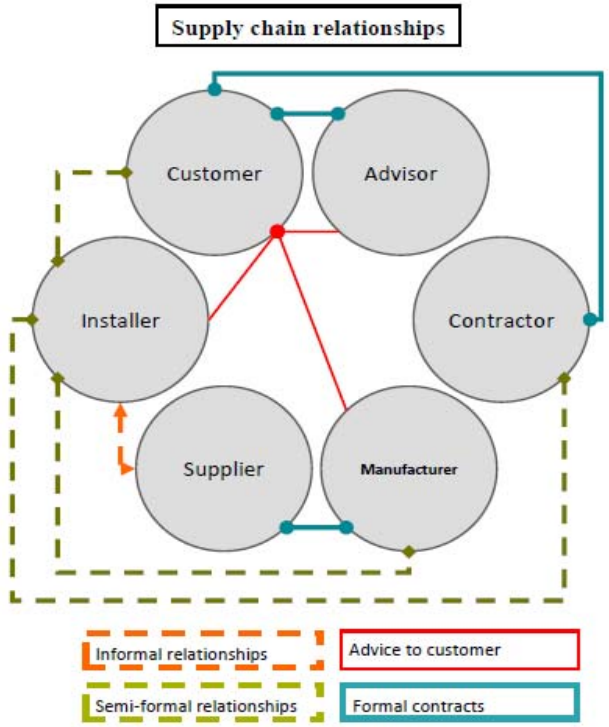
1. The first diagram shows the value distribution from the customer (social landlord or private sector owner-occupier) to each of the stages of the supply chain as a proportion of the total value of IEE work commissioned in the south west. The width of the arrow provides an indication of the proportion of the value and an approximate proportion (to the nearest 5%) is included. This was based upon the qualitative evidence collected in this study.
2. Through the vertical bars, the second diagram provides an indication of the level of activity in terms of the number of businesses delivering IEE work in the south west.
    - The diagram shows that there are businesses based inside and outside the south west delivering work within the region.
    - An estimate of the number of businesses in the south west working at each supply chain stage (split by retrofit specialist, active generalists and passive generalists) is provided, based on the estimates generated by this study and the qualitative evidence.
    - It was not possible from this research to identify the number of businesses working for individual markets e.g. social or private housing, so the figures provided are the number of businesses delivering IEE work for both private and social housing sectors.
    - It should also be noted that the number of passive generalists are solely based on the qualitative research and are an indication only.
    - The number of businesses outside the south west is based on the qualitative interviews with businesses in the south west in this study and are therefore only indicative.

    The purple curved line provides an approximate indication of value retained by each stage of the supply chain and the extent to which this is retained by businesses inside or outside the south west.
3. The third diagram shows the nature of the relationships between businesses at each stage of the supply chain, including:
    - Who provides advice to the customer
    - The key parties involved in main retrofit contracts
    - Where frameworks or preferred supplier lists exist
    - Where there are less formal relationships between businesses at different stages of the supply chain.

The sections following the diagrams provide a written commentary of the value chain analysis.

Figure 13: Intensive energy efficiency value chain analysis for the social housing market



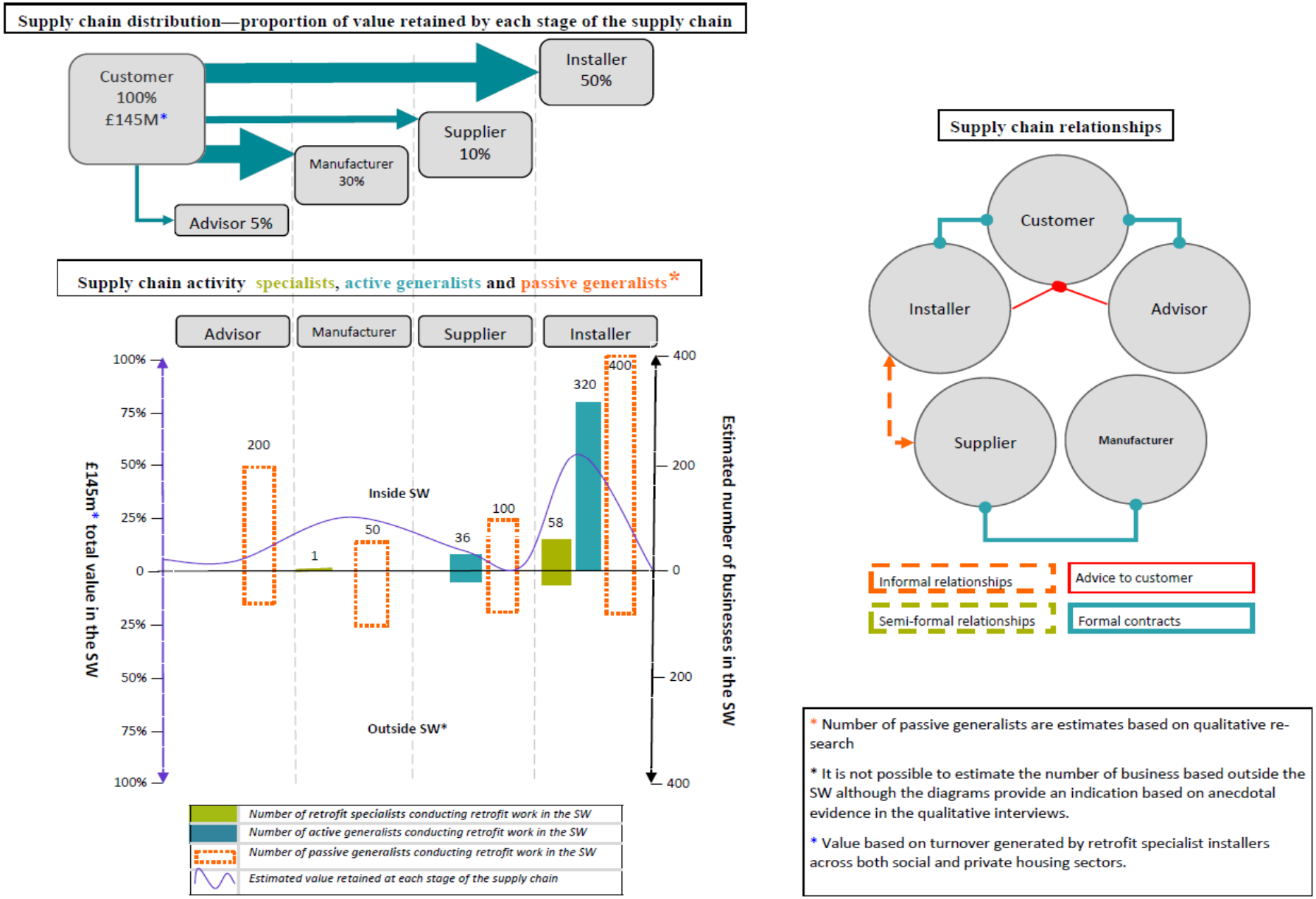


* Number of passive generalists are estimates based on qualitative research

* It is not possible to estimate the number of business based outside the SW although the diagrams provide an indication based on anecdotal evidence in the qualitative interviews.

* Value based on turnover generated by retrofit specialist installers across both social and private housing sectors.

Figure 14: Intensive energy efficiency value chain analysis for private sector housing



* Number of passive generalists are estimates based on qualitative research

* It is not possible to estimate the number of business based outside the SW although the diagrams provide an indication based on anecdotal evidence in the qualitative interviews.

* Value based on turnover generated by retrofit specialist installers across both social and private housing sectors.

8.4 IEE measures installed

Insulation: The main focus for intensive energy efficiency retrofit work in the south west is the installation of external wall insulation (EWI). Internal wall insulation (IWI) can also be installed alongside EWI on applicable properties, or as a measure on its own, however there is proportionately less of a focus on it. IWI is often viewed as an alternative measure, for example, where EWI is not possible due to cost, technical or planning related issues.

When EWI is being installed as a lead measure, often other measures are installed at the same time due to the nature of the work disrupting the fabric, fixtures and fittings in a property and because it provides an opportunity to achieve economies of scale, for example through fully utilising scaffolding, which is needed for the works. These measures include:

- Other measures eligible under ECO, for example loft insulation and boiler replacement
- Glazing
- Ancillary work such as roofing, guttering and plastering.

Other IEE measures: Due to the small sample sizes included in the study it has not been possible to provide an accurate estimate of the number of businesses involved in installing other measures, such as mechanical heat recovery, fluid cooling systems etc., however the qualitative research provides a strong indication that this is low. Interviews with the supply chain suggest that these measures formed a relatively small part of their business activity overall, due to low customer demand within both private and social housing markets. In addition, Registered Social Landlords (RSLs) interviewed also suggested they were not considering these measures due to their costs and that there is not currently any funding to support the cost of them.

8.5 Customer demand

Evidence collated indicates that the supply chain are conducting some intensive energy efficiency work for both the social housing and private owner/occupier markets. Table 5 draws on data from the study research to summarise the main drivers within each market for the installation of intensive energy efficiency measures.

Table 5: Demand drivers for IEE by domestic housing market

	Demand Drivers for IEE by domestic housing market		
IEE Measures	**Social housing**	**Private (owner occupiers)**	**Private (rented)**
EWI **IWI** **Ancillary measures**	Regulations such as the Decent Homes Standard[41] mean that social housing properties must meet thermal comfort criteria, and therefore they are considering wider energy efficiency improvements for their housing stock. ECO funding is used to support the cost of measures.	The supply chain businesses that work within the private housing sector cited rising fuel prices as the main driver for owner occupiers to consider their energy usage and ways to decrease energy consumption to save money and improve thermal comfort. This type of work tends to get considered when other work is being conducted, such as renovations. In these cases, IEE measures are driven by the supply chain recommending measures as part of a programme of works. Local Authorities and ECO providers report targeting owner occupiers to have IEE work completed as part of larger scale projects in targeted geographic areas. This is recent activity and too early to comment on its likely success. Local Authorities anticipate targeting vulnerable groups in particular to be challenging.	Future regulations, part of the Energy Saving Act 2011, mean that tenants will have the right to ask for energy efficiency improvements to their properties from their landlords, and it will be illegal to let a property that falls below a specified minimum EPC rating. At present there is little demand as the regulations won't come in to force until 2016.

The sections below discuss the study findings in relation to how the social housing and private housing markets commission intensive energy efficiency work. There is currently very little demand or activity in the private rented market, so this was excluded from the research[42].

8.5.1 Social housing market

Demand: Social landlords stimulate demand within the intensive energy efficiency retrofit supply chain, through the commissioning of work for multiple property schemes. Respondents were mainly considering solid wall insulation, and those interviewed had a preference for EWI (including ancillary measures) on the basis that this causes less disruption for their tenants during installation.

Scale: Respondents were looking to commission EWI work to in the region of 100 to 200 properties for each major set of works. Respondents explained that the scope of works that they commission is generally driven by a blend of the various funding sources available, and the current state and suitability of the housing stock to which measures are to be applied. Other influencing factors also included regulations such as Decent Homes Standard.

[41] https://www.gov.uk/government/policies/improving-the-rented-housing-sector--2/supporting-pages/decent-homes-refurbishing-social-housing

[42] See literature review for further details.

Funding: Funding for these schemes comes from a variety of sources, although it mainly comprises funding from energy utilities (via the Energy Company Obligation - ECO) and internal funds, which is used in combination to funding the improvement of the housing stock in line with their financially regulated obligations through the Homes and Communities Agency. Respondents also stated that they look into the possibility of other funding that could be available to support the cost of the work (e.g. Local Authority funding or central Government sources), although specific schemes were not mentioned.

With regards to ECO funding, respondents explained that they had initially high expectations of the level of ECO funding that could support the cost of the work when the scheme started in January 2013. However on further investigation, they learned that ECO would be more likely to support in the region of 20-30% of the total costs of the work, which is broadly in line with previous funding schemes such as CESP[43].

Commissioning works: Social landlords work closely with ECO providers[44] to develop a scheme. When designing a scheme for multiple properties, ECO providers advise social landlords to consider other ECO eligible measures (e.g. Cavity Wall Insulation (CWI), loft insulation and heating systems. This means that wherever there are applicable properties, these traditional energy efficiency measures are often included as part of the overall scheme. However, the numbers of properties that receive these are now likely to be limited, due to previous funding programmes such as CERT already achieving high coverage across the UK, particularly in social housing[45].

Respondents reported that they had aspirations to commission this type of work to businesses in the south west; however in reality, due to the large size of the contracts, the work is usually won by large national contractors. Interviews with national contractors found that on winning one of the contracts, they subsequently sub-contract a large proportion (estimated more than 80%) of the installation works to south west businesses.

Social landlords reported two main routes to commissioning IEE work and accessing ECO funding:

1. RSLs commission and manage the schemes themselves and then 'sell' the carbon to an ECO provider. In these cases an invitation to tender for the work is released in line with national and EU procurement rules. RSL's have an aspiration and willingness to buy local but are bound by open procurement rules. Due to the size of the contracts involved to deliver large schemes, RSLs most often contract with national contractors (e.g. Carillion or Willmott Dixon) as they have the capacity, skills, turnover levels and relevant insurances to manage all of the work. RSLs do, however, specify that a proportion of the work should be sub-contracted to local suppliers and their choice of contractor is often based on the business that will sub-contract the highest proportion of work to local businesses.
2. Alternatively RSLs can commission the work directly to an ECO provider to manage it on their behalf. In these cases the ECO provider would specify the work and a contractor on the ECO provider's preferred list would be used to carry out the work. Again, this could be a national contractor or if a smaller project, a local business. ECO providers try to use local businesses,

[43] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48210/3342-evaluation-of-the-community-energy-saving-programm.pdf

[44] ECO providers can take the form of utility companies working directly with the market, or brokers and large contractors commissioned to work on their behalf.

[45] Whilst the EST Home Analytics tool shows that there are approximately 1 million homes with inadequate levels of loft insulation and 750,000 properties without cavity wall insulation, it is unclear what proportion of these are in the social housing sector. As Carbon Emissions Reduction Target (CERT) met its target, it is likely that there are relatively few social housing properties remaining without these measures already in place. To further support this, the social landlords interviewed suggested that there are very few properties remaining without these measures.

and therefore are building frameworks of local suppliers for this purpose[46]. The ECO provider would then invoice the RSL for any value of work that could not be fully funded under ECO.

8.5.2 Private owner occupier market

Demand: The market for IEE work in the private housing market is reported to be considerably smaller in comparison to the social housing market[47]. Where IEE activity is taking place, this principally lies within the owner occupier sector[48] and includes EWI and IWI.

Funding: The private owner-occupier market can access both ECO and Green Deal funding to support the cost of EWI and IWI work. However, there has been limited private housing work undertaken under ECO[49] and limited demand for retrofit incentivised by Green Deal in the south west as well as nationally. To date 45,000 Green Deal Assessments have taken place in the UK (4,000 in the South West) and 3,400 green deal works completed[50] in the UK (300 in the South West). Reasons for this are discussed further in the barriers section of the report but in brief include householder concerns with regards to Green Deal interest rates, and complexities involved in gaining access to funding (which includes home visits and multiple forms to fill in).

Commissioning works: There are two main routes to commissioning IEE retrofit works:

1. Works undertaken as part of property renovation or upgrade: In this scenario the owner occupier will usually contact local builders/installers based on word of mouth recommendations, and less frequently through general internet searches[51]. Works are carried out with or without available incentives or subsidies (e.g. Green Deal).
2. Work incentivised by energy efficiency policy measures (e.g. Green Deal, ECO)[52]:
    - When work is undertaken under the Green Deal, owner occupiers will commission a Green Deal Assessment to find out which measures would be most appropriate for their property. A Green Deal Provider can suggest Green Deal accredited installers to carry out the work and will organise Green Deal finance on the owner-occupiers behalf.
    - For ECO funded work the owner occupier is usually contacted by a local authority or an ECO provider who will manage the work and will either install the measure themselves or contract the work to a local PAS2030 accredited installer.

8.6 The role of advice in the supply chain

The study estimates that approximately 300 businesses[53] in the south west provide advice to those commissioning IEE retrofit work. This group includes architects, surveyors, energy assessors and

[46] This is based on two interviews with ECO providers and RSL's experience of working with ECO providers, and therefore it is unclear whether all ECO providers aim to use local installers.
[47] This is due to a number of factors discussed further in the Barriers section of the report.
[48] The research with the supply chain found very little demand or supply in the private rented sector.
[49] Informed by the qualitative interviews with Local Authorities and ECO providers
[50] Based on Green Deal cash back vouchers paid https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/259374/Statistical_Release_-_Green_Deal_and_Energy_Company_Obligation_in_Great_Britain_-_19_Nov_2013.pdf
[51] It wasn't within the scope of this research to quantify which methods of identifying a local builder or installer are most common, but the qualitative interviews with installers suggests that word of mouth recommendations are the most common form of them winning work.
[52] This is based on the qualitative interviews with installers, local authorities and ECO providers.
[53] Based on 16 interviews with businesses whose principal stage of involvement in the supply chain is design or advice.

consultants and retrofit works are usually included as part of a wider programme of works, such as renovations in the private market and large contracted works in social housing.

Social housing: Social landlords report rarely seeking independent advice from architects or consultants prior to commissioning work mainly due to the costs involved. However, they are often offered, and engage with, other businesses offering technical advice, including:

- EWI manufacturers seeking to build relationships in order to secure take up of their products
- Installers of EWI systems; these tend to be either large national businesses with regional sales managers or relatively large south west based installers[54]. The installers encourage social landlords to incorporate multiple measures within schemes to provide best value for money and energy/CO2 savings. For example, including ancillary measures (e.g. roofing, guttering and other appropriate insulation measures) whilst installing EWI to maximise the efficient use of scaffolding.
- ECO providers[55] also encourage RSLs to commission retrofit work to include a range of ECO eligible measures across intensive and cost-effective energy efficiency technologies, including cavity wall insulation and loft insulation on a small proportion of properties[56]. Social landlords commented that this made the process of putting a scheme together more time consuming and challenging[57].

As a result, when tendering for IEE schemes social landlords may choose to:

- Include in the invitation to tender an exact specification of EWI product to install (based on previous tenders or frameworks or on an informal relationship with a manufacturer).
- Include a general specification for the EWI performance required within a scheme, which is intended to open up the competitive element within tender submissions to recommend which EWI system should be used and ensure that the schemes take advantage of the highest performing EWI system with the tender value.

Private owner/occupier market: Where private owner occupiers are looking to renovate or upgrade their property, design advice is regularly sought from an architect or other suitable accredited design provider to design extensions or alterations to their property. Architects will usually advise clients about energy efficiency improvements as part of the design process and have a good awareness and understanding of the impact and considerations required for IEE measures. This knowledge is kept up to date through attending training and seminars as part of their continual professional development requirements. Whilst some home owners will be amenable to the suggested IEE measures made by an architect, more often than not they are reported to be principally concerned with other aspects of the works such as increasing the amount of floor space or the quality of fittings, fixtures and furnishings, which limits the opportunity available.

Where owner occupiers were specifically seeking energy efficiency improvements, they may seek advice from a Green Deal Assessor or other consultant[58]. Green Deal assessors will assess the property

[54] Over 50 employees.

[55] The qualitative interviews suggest this is widespread practice amongst all ECO providers, although we cannot say that all ECO providers do this.

[56] It isn't possible to quantify the proportion of properties that are installed with cavity wall or loft insulation from this research, but RSLs gave a sense that they would be installed on less than 5% of the total number of properties included in a scheme.

[57] Although there wasn't scope within the interviews to discuss in detail.

[58] E.g. following a Green Deal assessment through an accredited Green Deal assessor.

utilising RSAP[59] software and recommend the most appropriate energy efficiency improvements that fit the Green Deal golden rule or ECO eligibility.

8.7 Manufacture in the supply chain

For insulation measures[60], insulation boards are manufactured outside the south west by a handful of main manufacturers (e.g. Knauf, Kingspan etc.), and there are two render manufacturers within the region.

Manufacturers provide product specific training to installers based on their products. Some of the manufacturers charge installers for this training, and training varies from one day courses to week long courses, depending on the product type and level of EWI experience the installer already has. In some cases, manufacturers do not charge installers for the training, as long as the installer signs up to exclusively use the products of that manufacturer.

Manufacturers have little contact with the end user, i.e. tenants in RSL and LA housing stock and homeowners in the private residential sector. Whilst they do receive enquiries from private owner/occupiers about their products, they do not have the sales capacity to deal with servicing customers at this level. In these instances they will provide the home owner with a list of registered installers of their products in their local area that have undergone their product specific training.

8.8 Supply and distribution in the supply chain

The qualitative research suggests that manufacturers adopt different approaches in supplying products to market, which is largely dependent on order size:

- Manufacturers will supply contractors/ installers directly for large quantities (generally for more than five properties) for example to contractors delivering major RSL schemes directly to site or via trade centres.
- Manufacturers will supply products through selected trade merchants to enable installers to purchase smaller quantities of IEE products locally (e.g. for small scale schemes, including private owner/occupier housing). There are estimated to be 25 businesses, typically trade merchants in the south west that supply intensive energy efficiency measures[61] (to installers via trade centres), the majority of products sold being directly related to installations in the private owner/occupier sector.

8.9 Installation in the supply chain

There are approximately 60 businesses in the south west region installing EWI and / or IWI products, which equates to £145 million in turnover within the supply chain. Approximately a further 300 businesses (active generalists) are involved at the installation stage of EWI and/or IWI products. These include plasterers, roofers and other ancillary trades.

It is also estimated that there is a significantly higher number of other business types involved at the installation stage of EWI and / or IWI products, such as general building contractors. Due to the number and type of businesses and their lower level of involvement in retrofit activity it is not possible

[59] RSAP software covers all calculation and lodgement requirements for the Green Deal, the Energy Company Obligation and domestic energy assessments

[60] Considering only insulation boards and render. There are other insulation products such as breathable membrane but these were not covered within this research.

[61] Based on interviews with 17 suppliers

to estimate the total number of businesses involved. However, these businesses tend to manage the overall contract and wider scheme works and will sub-contract the insulation installation to a specialist with the relevant accreditations. Based on 10 interviews with general builders, four indicate they deliver IEE work, although they did not specify PAS 2030 as an accreditation they carry. Whilst they also indicated that they sometimes specifically deliver EWI work, in the majority of cases they sub-contract the work to a specialist with PAS 2030 accreditation.

For the social housing market, in most cases a national building services contractor is contracted to deliver the overall scheme of works for EWI and associated measures. There are no national contractors based in the south west region. This main contractor then sub-contracts the majority of the installation work to local businesses based within the region where they cannot deliver the work with their own teams, often resulting in a blend of local and national contractor teams working on the same scheme. For ECO funded work the EWI installer must have PAS 2030 accreditation. Whilst it has not been possible to determine an accurate estimate of the number of installers in the south west with PAS 2030 accreditation, the Regen SW supplier directory suggests there are approximately 20.

For the private owner / occupier sector, it is usually a local installer who wins and conducts the work via their existing connections locally, word of mouth, or through their web site or directory listing. The work will either be managed by the owner occupier or by a small local building contractor if the insulation measures form part of wider renovation work to the property.

8.10 Maintenance in the supply chain

For maintenance of intensive energy efficiency measures, the responsibility typically falls to the installer in line with their contracts and warranty responsibilities. Even when a national contractor delivers the main contract, their terms and conditions specify that the installer must be held responsible for any maintenance work. For ECO, EWI and other related measures must include a 25 year warranty. Installers involved in installing EWI measures have indicated that limited maintenance work to IEE measures is required in both the social and private owner occupier sectors, however they anticipate having to perform maintenance work within the 25 year warranty lifetime as and when technical issues arise. This maintenance warranty forms part of the original contract with the main contractor, rather than a separate contract specified for maintenance work in isolation.

8.11 Barriers within the IEE supply chain and opportunities to overcome them

Identified barriers

1. Lack of demand for IEE measures

- With the social housing sector, there are continued barriers to uptake of measures without the early stage subsidies required to stimulate the market and bring down the cost of technology and installation. Social landlords also find the application process for drawing down subsidies such as ECO challenging in terms of administrative and technical requirements.
- For the private owner / occupier market, limited uptake of the Green Deal via Green Deal plans is a barrier to demand as the majority of owner occupiers cannot afford the cost of the measures outright.
- ECO providers are slow to prepare applications for ECO funding for the south west region

Suggested actions and opportunities

To overcome these barriers, Regen SW and partners should:

- ***Short-term:*** *Share existing data (e.g. EST's Home Analytics tool and Local Authority housing stock data) on properties with ECO providers to enable them to more quickly prepare and submit ECO applications for the South West.*
- ***Medium term:*** *Influence national and local government to invest in IEE measures such as solid wall insulation, through the existing ECO or similar, to provide longer term stability in the market, and encourage businesses to invest in the skills, capacity and accreditation (PAS 2030) required to deliver IEE measures at scale.*
- ***Medium term:*** *Further promote the Green Deal in the south west to help increase awareness of the finance mechanisms to support the cost of measures in the owner occupier market in order to drive demand.*

2. Lack of specialist accredited IEE installers

- Businesses are reluctant to invest in accreditation due to lack of demand in the private sector and their experience of not being able to get involved in work in the social housing sector.
- Micro businesses (less than 9 employees) find the administrative process of accreditation difficult due to the time it takes and therefore the cost to the business.

Suggest actions and opportunities

To overcome these barriers, Regen SW and partners should:

- ***Short term:*** *Continue promotion of R4R and ECO to convince generalist and ancillary businesses to up-skill and invest in training and accreditation to increase the capacity in the supply chain to deliver IEE work.*
- ***Long term:*** *Work with colleges and training providers to develop training schemes to enable installers to install products from multiple manufacturers. This will enable greater impartiality when recommending and selecting products to install, and therefore help to ensure installers are installing the most suitable product for each property.*

3. The main contracts are won by businesses outside the South West

- RSL procurement rules mean large scale contracts are won by large contractors, of which none are based in the South West (although some of the tendered scheme measures will be subsequently subcontracted to south west businesses).

Suggested actions and opportunities

To overcome this barrier, Regen SW and partners should:

- ***Medium term:*** *Help businesses to develop their capacity and ability to deliver the main contractor role in delivering IEE work, such as project management skills.*
- ***Medium term:*** *Help south west businesses form consortia in order to provide the capacity and skills required by social housing contracts so that they are successfully able to bid for this work, against competition from outside the south west.*

9 Microrenewable electricity

This section provides an analysis of the microrenewable electricity (RE) sub-sector of the retrofit market, defined as individual projects with a scale of less than 50kW installed peak capacity. This includes activity relating to the following technologies:

- Solar photovoltaic
- Micro-wind
- Micro CHP.

9.1 Overview of sub-sector

The table below summarises the key findings from the study specific to the microrenewable electricity sub-sector, which are explored in more detail in the sections below. The figures are based on the retrofit specialists and active generalist groups only.

Table 6: Overview of microrenewable electricity sub-sector

Number of businesses (approx)	750
Turnover	£338million
Number of employees	600
Skills	Specialist technical skills required to install measures, although there appears to be sufficient supply to fulfil demand. Accreditations: MCS accreditation on production of technologies and installing technologies.

9.2 Scale of the microrenewable electricity supply chain in the South West

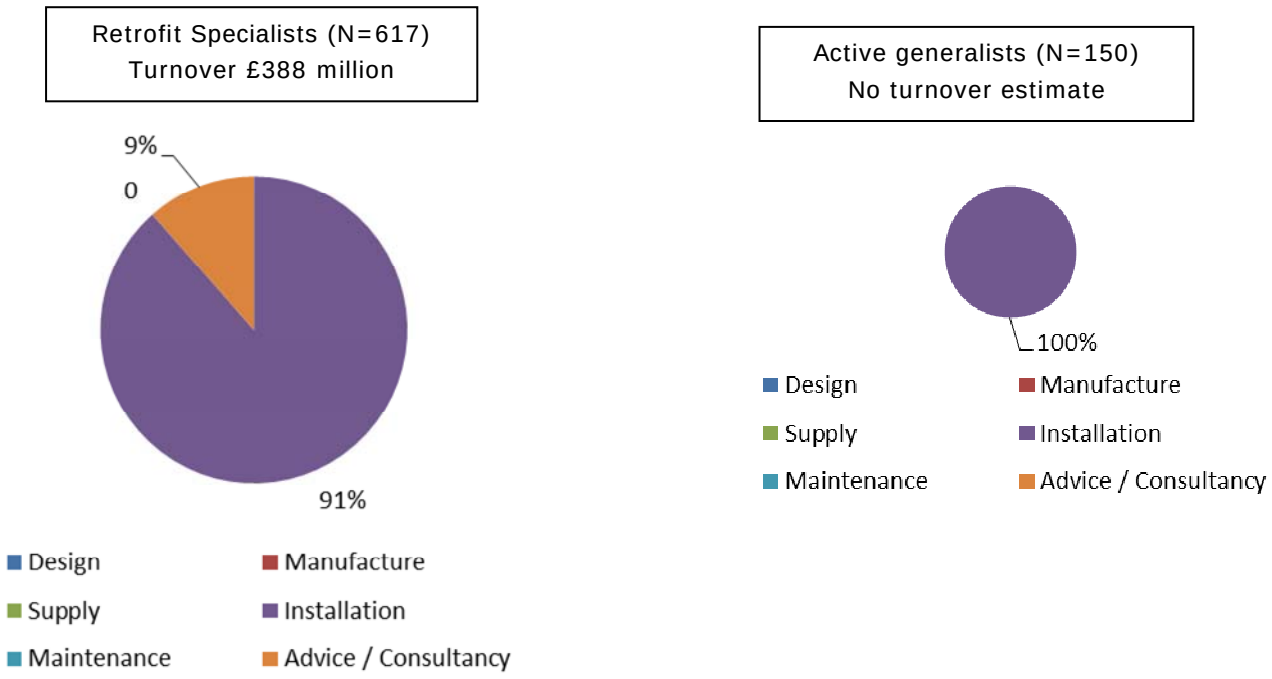
Retrofit specialists: There are estimated to be approximately 600 retrofit specialist businesses working in the microrenewable electricity supply chain, most (91%) of which are installers and the remainder consultants conducting feasibility work and providing advice[62]. These specialist businesses are likely to be MCS accredited and lead the installation design, installation delivery and aftercare services directly for customers, or as sub-contractors within wider (e.g. multiple measure) works. The turnover relating to this sub-sector is estimated to be approximately £388m[63]. The research did not find evidence of businesses undertaking manufacturing, supply or maintenance as their principal activities.

Active generalists: There are an additional 150 generalist businesses working specifically within the renewable electricity subsector, all of which are involved at the installation stage. This group of installers are involved in trades such as roofing and electrical contractors who conduct ancillary work whilst solar PV is getting installed, but do not install renewable electricity technologies themselves. It was not possible to provide an estimate of the turnover specifically relating to this sector[64].

[62] Note there is considerable overlap between these groups as many installers also claim to provide advice (although the 91% have self-identified installation as their primary activity).
[63] Turnover data provided by Regen SW was used to produce this estimate.
[64] Due to lack of information provided by respondents.

Passive generalists: There are also 37% of passive generalists who identify themselves as undertaking some activity to support microrenewable electricity. This includes over 500 organisations providing advice to customers, including consultants and architects, and businesses (e.g. building contractors) who specify microrenewable electricity measures and / or sub-contract works to specialists. It was not possible to provide an estimate of the turnover specifically relating to this sector.

Figure 15: Proportion of specialist and generalist sub-sector RE businesses working at supply chain stages



9.3 Microrenewable electricity value chain analysis

The study findings were used to provide an analysis of the value chain for the renewable electricity supply chain, informed mainly by the qualitative research[65]. Renewable electricity activity is evident in both social and private housing markets. As these markets operate in different ways, separate value chain diagrams have been produced.

The total turnover specific to the Renewable Electricity sector is estimated to be £388 million. Although it was not possible to accurately quantify the total values of retrofit activity within the private and social housing sectors specifically through the research, the qualitative research indicated that the majority of activity was being undertaken in the private sector.

The value chains are each made up of three diagrams:

1. The first diagram shows the value distribution from the customer (social landlord or private sector owner-occupier) to each of the stages of the supply chain as a proportion of the total value of microrenewable electricity work commissioned in the south west. The width of the arrow provides an indication of the proportion of the value and an approximate proportion (to

[65] Due to the small scale of the market and nature of the value chains analysis.

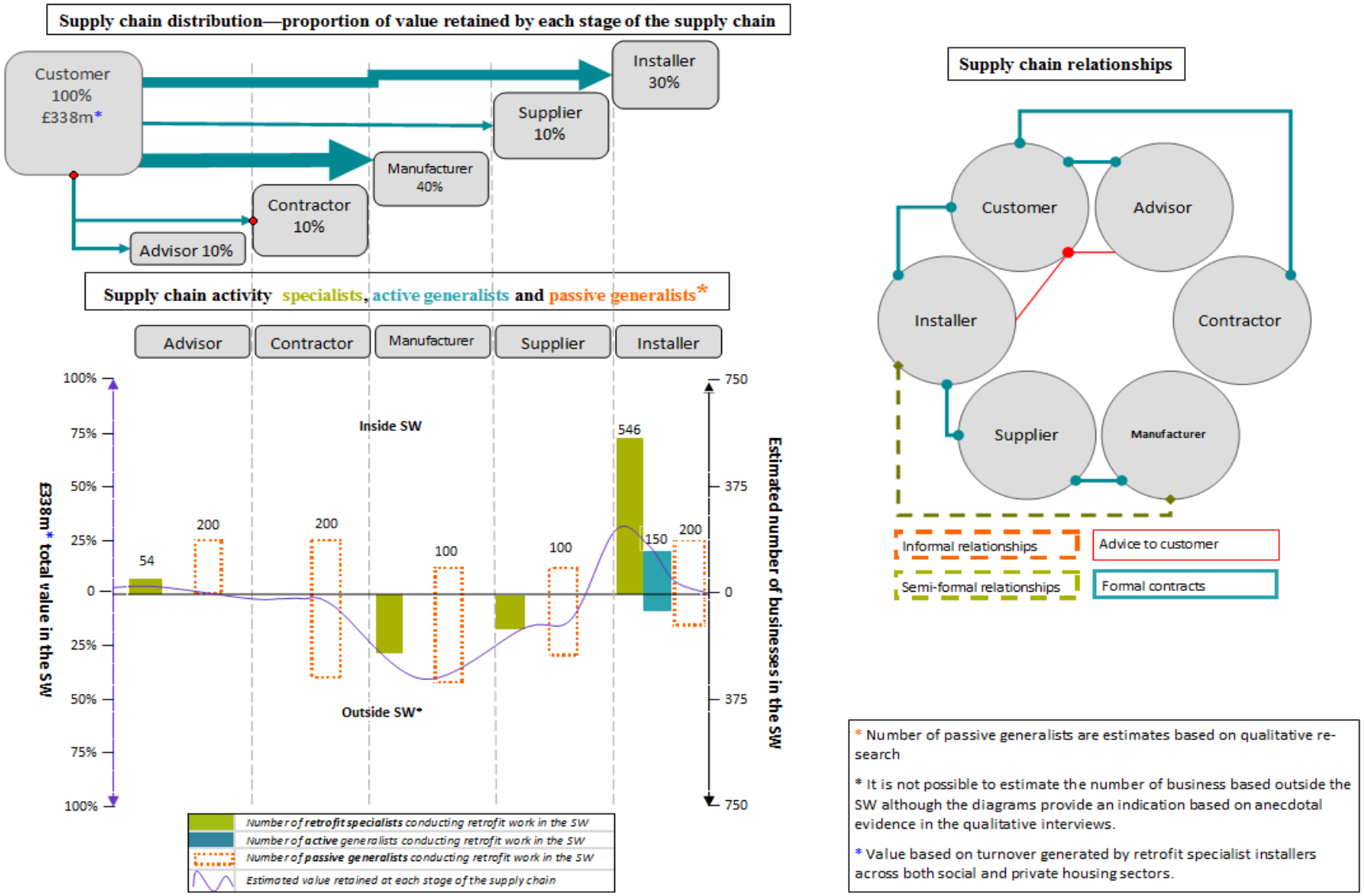
the nearest 5%) is included. This was based upon the qualitative evidence collected in this study.

2. Through the vertical bars, the second diagram provides an indication of the level of activity in terms of the number of businesses delivering microrenewable electricity work in the south west.
    - The diagram shows that there are businesses based inside and outside the south west delivering work within the region.
    - An estimate of the number of businesses in the south west working at each supply chain stage (split by retrofit specialist, active generalists and passive generalists) is provided, based on the estimates generated by this study and the qualitative evidence.
    - It was not possible from this research to identify the number of businesses working for individual markets e.g. social or private housing, so the figures provided are the number of businesses delivering microrenewable electricity work for both private and social housing sectors.
    - It should also be noted that the number of passive generalists are solely based on the qualitative research and are an indication only.
    - The number of businesses outside the south west is based on the qualitative interviews with businesses in the south west in this study and are therefore only indicative.

    The purple curved line provides an approximate indication of value retained by each stage of the supply chain and the extent to which this is retained by businesses inside or outside the south west.
3. The third diagram shows the nature of the relationships between businesses at each stage of the supply chain, including:
    - Who provides advice to the customer
    - The key parties involved in main retrofit contracts
    - Where frameworks or preferred supplier lists exist
    - Where there are less formal relationships between businesses at different stages of the supply chain.

The sections following the diagrams provide a written commentary of the value chain analysis.

Figure 16: Value chain analysis for microrenewable electricity (social housing)

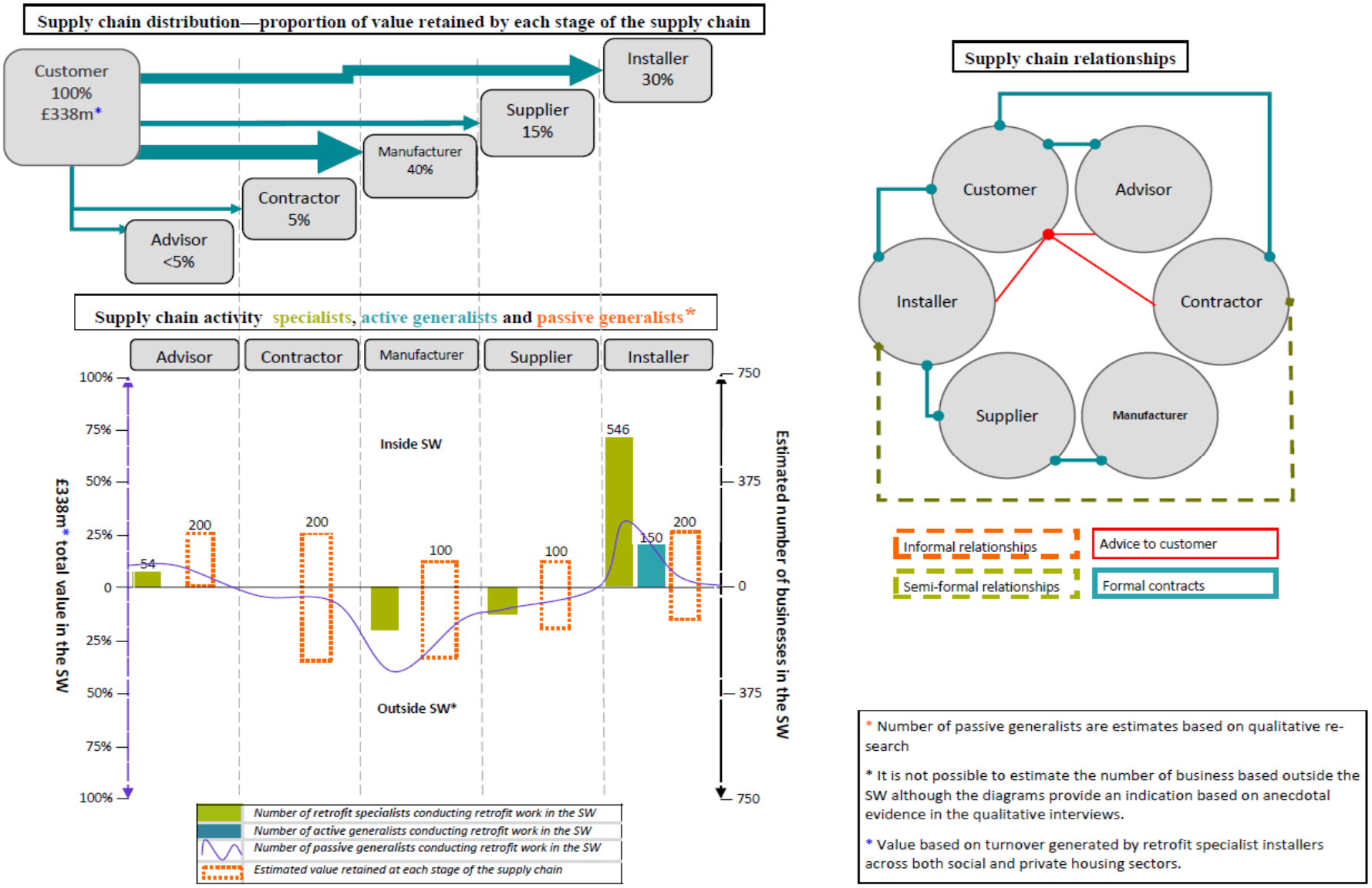


* Number of passive generalists are estimates based on qualitative research

* It is not possible to estimate the number of business based outside the SW although the diagrams provide an indication based on anecdotal evidence in the qualitative interviews.

* Value based on turnover generated by retrofit specialist installers across both social and private housing sectors.

Figure 17: Value chain analysis for microrenewable electricity (private housing)



* Number of passive generalists are estimates based on qualitative research

* It is not possible to estimate the number of business based outside the SW although the diagrams provide an indication based on anecdotal evidence in the qualitative interviews.

* Value based on turnover generated by retrofit specialist installers across both social and private housing sectors.

9.4 Measures installed

Solar PV: The main measure currently installed is solar photovoltaic (PV), accounting for the majority of market activity in terms of the number of installations[66]. Whilst there are businesses within the south west with the skill set to deliver micro wind and micro CHP, little current activity was found through the research, reported to be due to low customer demand[67].

9.5 Customer demand

There is significant demand for solar PV within the region for both the social and private owner occupier sectors, reported to be mainly as a result of the Feed in Tariff (FIT) subsidy available and active supply chain delivering installations in the south west. There is no specific regional data available to determine the scale of the market for the South West, although data on solar PV registrations (supported by FIT) nationally show over 100,000 installations were made across the UK in 2013, which using a household average split would mean 9,000 installations per year[68]. The market is known to be more developed in the south west than elsewhere in the UK, so this is likely to be a conservative estimate.

Table 7: Drivers for microrenewable electricity technologies

Measures	Social housing	Private (owner occupiers)	Private (rented)
Solar PV	RSLs have seen successful examples of solar PV installations and consider the measure as a way of reducing the fuel poverty for tenants and to generate an income from the FiT for the social landlord to invest in other energy efficiency improvements across their housing stock.	There is continuing demand for solar PV now the market has settled following changes to FiT levels in 2012. Respondents suggested that demand has been increasing again. Increasing energy prices have also encouraged owner occupiers to look at ways of reducing the amount they spend on energy and with the reducing technology cost and attractive rates of return for PV systems, installation of this measure remains an attractive option.	The research did not find any demand for solar PV in the private rented market.

Social housing: As described above, social landlords reported stimulating demand for PV, commissioning works after delivering a successful pilot on their stock, or after seeing successful installation examples elsewhere.

Scale: It is not possible to accurately determine the size of the social housing market, but social landlords interviewed reported they were considering or delivering a small number of projects. On average, these projects included 40 to 50 properties each, although this depends on the suitability of the housing stock[69].

Funding: Funding for the works would either be self-funded through internal funds, or through accessing finance from a third party provider, either directly sourced or through working with contractors delivering the works.

[66] 2013 DECC statistics show that the vast majority of FIT supported installations is for solar PV.
[67] This was reported by qualitative research respondents, citing lack of customer awareness of the technologies and opportunity (i.e. suitability, such as for micro wind) were the main factors behind low take up.
[68] DECC solar PV installation and capacity, based on registration date (16 Dec 2012 – 13 Dec 2013).
[69] This also does not consider other microrenewable or energy efficiency measures as part of the works.

Commissioning works: Respondents reported selecting local installers where possible, however if the contract value goes above EU OJEU specified limit[70] RSL's are required to go through full EU procurement, in which case large national contractors were more likely to win tenders due to economies of scale meaning they are able to deliver due to their size. When this occurs, national contractors then tend look to sub-contract to one or more local installers where capacity is required to deliver schemes outside of their geographic heartland, but the extent to which this is done is outside of the control of social landlords[71].

Private owner occupier market: The qualitative research indicated that most (over 90%) of the total microrenewable electricity activity is occurring in the owner occupier sector. Installers reported that activity has picked up following a significant decrease in activity when the FiT rate was lowered in 2012. Rising fuel bills are encouraging home owners to look at ways of reducing the amount of money they spend on energy, particularly for those who have a fixed income and who are looking to maximise their disposable income through reducing energy bills.

Scale: As described above, a conservative estimate of the scale of the market shows that over 9,000 solar PV installations were installed in 2013, based on national statistics.

Funding: Installers indicated that to date, funding has largely been provided directly by the householder. In future it is expected that finance solutions (e.g. through the green deal) will play a role, although to date PV has played a limited role in green deal uptake (8% of UK-wide Green Deal Assessments)[72].

Commissioning works: Installers reported that where an owner-occupier considers solar PV they may have already done some of their own research into the measure through a general web search, and then use the internet or word of mouth referrals to identify a handful of local solar PV installers to contact for further information and quotes for the work. Where solar PV work is commissioned as part of other works, for example renovation works or an extension to the property, installers stated they are generally sub-contracted by a local building contractor. Respondents stated that there is likely to be significant additional 'untapped' demand for solar PV in the market, but due to lack of householder awareness or understanding of the technology this was not currently being exploited.

Respondents stated that approximately one third of solar PV enquiries received from private owner / occupiers results in a commissioned installation. A further third of enquiries result in the technology being identified as unsuitable for the property in question, and the remaining third of enquiries do not materialise in a commissioned installation, either because the private owner / occupier changes their mind regarding having the technology installed at all or because the owner occupier selects another contractor, usually due to them quoting a lower price.

9.6 The role of advice in the microrenewable electricity supply chain

Within the south west there are estimated to be approximately 500 businesses that state they are able to provide advice on microrenewable electricity measures, with this usually forming a small part of their core business. In the main, these businesses are architects who are designing renovations or extensions and include solar PV as part of the works[73]. In addition, surveyors who conduct Energy Performance Certificates (EPCs) and Green Deal Assessors also form part of the advice stage of the

[70] £4,348,350. http://www.ojec.com/Threshholds.aspx
[71] As reported by interviewed installers.
[72] Research for DECC in June 2013 shows that out of 1,259 measures recommended across all Green Deal Assessments in the UK, 111 (8%) included solar PV.
[73] Either as suggested by the architect, or specifically requested by the client.

supply chain, however as shown above, there are currently only 8% of green deal assessments, which include PV as a specific measures across the UK.

Once a customer is interested in an installation, installers also advise customers on a number of areas, including property roof space requirements, pitch, orientation, connectivity and other considerations such as shading. This helps to which determine the viability of the installation including income and pay back periods under the FiT.

Social housing: Social landlords tend to seek advice through feasibility work by procuring consultancy to understand the extent to which the technology presents an opportunity for their stock. They also report gaining information from other RSLs, local authorities and other providers (e.g. RegenSW and Energy Saving Trust), for example about technology performance and feasibility. When commissioning works for solar PV schemes, respondents asked suppliers to specify a solar PV product system and provide information relating to estimated outputs, cost, maintenance requirements and the useful asset life of the technology in order to determine the full life cost and income that is generated. They would then consider proposals and select a successful candidate based on the option which provides the best value[74].

Private owner occupiers: Respondents reported that owner occupiers seek out and receive advice through various routes including:

- Conducting their own research into renewable electricity measures using the internet and other potential sources Such as the Energy Saving Trust advice line or local advice giving organisations
- Seeking advice from a building contractor if other works are planned for the property
- Comparing information provided within the quote from installers of solar PV, including costs.

9.7 Manufacture

The study found no manufacturing activity for microrenewable electricity measures within the south west, with most being supplied from overseas (e.g. China). There may be manufacturing of supporting materials (e.g. panel brackets, inverters etc.) but exploration of this was not within the scope of the research.

9.8 Supply / Distribution

There are an estimated 80 trade merchants who supply microrenewable electricity technologies within the south west. This group usually supply a wide range of domestic plumbing and heating equipment and parts to trade customers, of which microrenewables play a small part (i.e. they are likely to be available at specially ordered equipment, as opposed to 'off the shelf'). In addition, Solar PV installers also purchase microrenewable electricity technology directly from national and international manufacturers or through national and international distributors, particularly when there are larger orders required for multiple properties.

9.9 Installation

The results from the quantitative survey suggest that there are approximately 540 businesses that install microrenewable electricity technologies within the south west, the majority of which focus on installing solar PV. The Microgeneration Certification Scheme suggests there are approximately 500

[74] Included within assessment of this 'value' RSLs explained that they consider the panel efficiency, the quality of the system, and the whole life cost of the system.

MCS accredited solar PV installers within the south west region. Approximately half of the MCS accredited solar PV installers are also MCS accredited to install solar thermal.

Table 8: MCS accredited installers in the south west by technology

Microrenewable electricity technology	Number of MCS accredited installers in the south west
Solar PV	500
Micro CHP	7
Wind	25

There are a further 150 businesses in the region that are involved at the installation stage of the renewable electricity supply chain, and this group consists of electrical, plumbing and roofing contractors that are carrying out ancillary work whilst solar PV is being installed.

Competition: Solar PV installers reported experiencing high levels of competition from other solar PV installers both from within and outside the south west. In some cases this competition appears to come from national contractors winning larger contracts for installing solar PV technology on social housing schemes. In other cases certain geographic areas of the south west face greater levels of competition due to their proximity of other major areas of retrofit activity such as South Wales and the Midlands. Installers reported that greater levels of competition have come about because of the proliferation of installers who became accredited following the introduction of the FiT, and then when demand for the technology decreased because of the change to the FiT in 2011/12 there is now less demand to compete for.

9.10 Maintenance

The study did not find any businesses in the south west that were currently generating their main income from turnover specifically related to maintenance activity of microrenewable electricity measures, mainly because the market is dominated by solar PV, which requires little on-going maintenance. However the qualitative research found two solar PV installers that were in the process of setting up the maintenance of solar PV as a separate service (e.g. cleaning and checking services). This may result a change to the type of business model offered by these businesses in the medium term. The study estimates there to be approximately 80 businesses that are involved in maintenance work of microrenewable electricity technologies, which is likely to form part of their accreditation obligations.

9.11 Barriers within the microrenewable supply chain and opportunities to overcome them

The research provided insights on a number of key barriers affecting market uptake, which are reported here alongside discussions with respondents as to what actions may help overcome barriers to facilitate future market growth. These include:

1. **Lack of demand:** There is an overall reported lack of awareness and understanding of microrenewable measures, particularly within the private owner occupier market, which accounts for over 90% of activity. This is due to a lack of market wide communications driving awareness. In addition, demand is also likely to be affected by the changes to the FIT levels in 2012, where householders may perceive measures to not represent a good return on investment. Other elements reported to affect demand include:

- Limited take up of the Green Deal in the private sector, and within this inclusion of PV as a measure within Green Deals.
- The majority of RSLs are taking a fabric first approach to their housing stock and are not rolling out solar PV on a large scale
- Lack of demand in particular for measures such as micro-wind and micro CHP due to a lack of awareness and understanding about the measures.

There are a number of opportunities to increase demand in the short and medium term by promoting campaigns to raise awareness and working with the market to help improve uptake, such as through Green Deal Assessments.

Actions which would help take advantage of these opportunities include:

Short term:

- *Encouraging the supply chain to work increasingly with local and national groups and campaigns to raise awareness in the market. In particular supporting national, local Government and third sector supported campaigns would help, as these messages are more trusted. In addition to national campaigns, there are local partnerships[75] and community energy groups, which would help increase awareness.*
- *Encourage the supply chain to signpost their customers to Government/impartial supported advice, such as through energy advice services provided nationally and locally to help provide customers with confidence to proceed with installations.*
- *Social housing market: Share successful examples of social landlord solar PV installations including the actual environmental and economic performance results and benefits, to encourage uptake in the social housing market. This could include developing written case studies for circulation and promotion or events to discuss examples and provide the opportunity for question and answer sessions.*
- *Green Deal Assessments: Working with south west based Green Deal Assessors to increase the extent to which solar PV is recommended and included within Green Deal, where it is appropriate.*

Medium term:

- *The industry as a whole should try to increase demand through raising awareness of Green Deal for the private sector. Opportunities should be sought within any partners who have contact with the private owner-occupier market to promote the Green Deal and provide calls to action – e.g. a Green Deal Assessment so that they are able to take the next step.*

2. **Competition is driving down prices and reducing profitability:** There are a significant number of MCS accredited installers of solar PV in the south west competing for a reduced demand in the domestic property marketplace, resulting in businesses fearing that they may go out of business due[76] to lower profit margins compared to new build and commercial work.

Actions which would help overcome this barrier include:

Medium term: Support businesses that are currently focused on microrenewable electricity to diversify into other measures to assist growth through diversity and ensure skills are not lost. Suggested forms of support include one to one business advice and coaching to look at potential areas for diversification and the skills required to successfully diversify.

[75] E.g. energy efficiency partnerships run by south west Local Authorities.

[76] It isn't possible from this research to estimate the total number of solar PV installers who fear they may go out of business, this finding is based on verbatim from a handful of respondents.

3. **Effects of contracts won by businesses outside the south west region:** Where solar PV demand exists, RSL procurement rules mean that some contracts are awarded to large (with a turnover in the region of £95 million) main contractors, of which none have a main base in the south west (although some of this will be subsequently subcontracted to south west businesses.)

Actions which would help overcome this barrier include:

Short term: *Helping South West businesses form consortia in order to provide the capacity and skills required by social housing contracts.*

Medium term: *Developing the skills and capacity within the region to do deliver the main contractor role through developing project management skills to support the design, specification and installation of multiple retrofit measures and technologies, across sub-sectors.*

10 Traditional energy efficiency

This section provides an analysis of the traditional energy efficiency sub-sector of the retrofit market, defined as including:

- Cavity wall insulation
- Loft insulation
- Floor insulation
- Condensing boilers
- Controls and monitoring systems
- Heating controls
- Energy efficient lighting
- Voltage optimisation
- Glazing.

10.1 Overview of traditional energy efficiency (TEE) sub-sector

The table below summarises the key findings from the study specific to the traditional energy efficiency sub-sector, which are explored in more detail in the sections below. The figures are based on the retrofit specialists and active generalist groups only.

Table 9: Overview of the traditional energy efficiency sub-sector

Number of businesses (approx)	2500
Turnover	£314million
Number of employees	8,000
Skills	Trade based skills such as electrical, heating and plumbing and glazing. More adequate supply of these skills to meet demand compared to other sub-sectors. Accreditation: Green Deal

10.2 Scale of the traditional energy efficiency supply chain in the South West

Retrofit specialists: There are estimated to be approximately 480 specialist businesses working in the traditional energy efficiency supply chain, 99% of which are installers[77] leading the installation of measures such as cavity wall insulation, boilers, loft insulation and glazing. Businesses in this group are relatively small in size and tend to specialise in specific measures (e.g. plumbers for boilers and heating controls, glazing contractors) or measure groups (e.g. insulation).

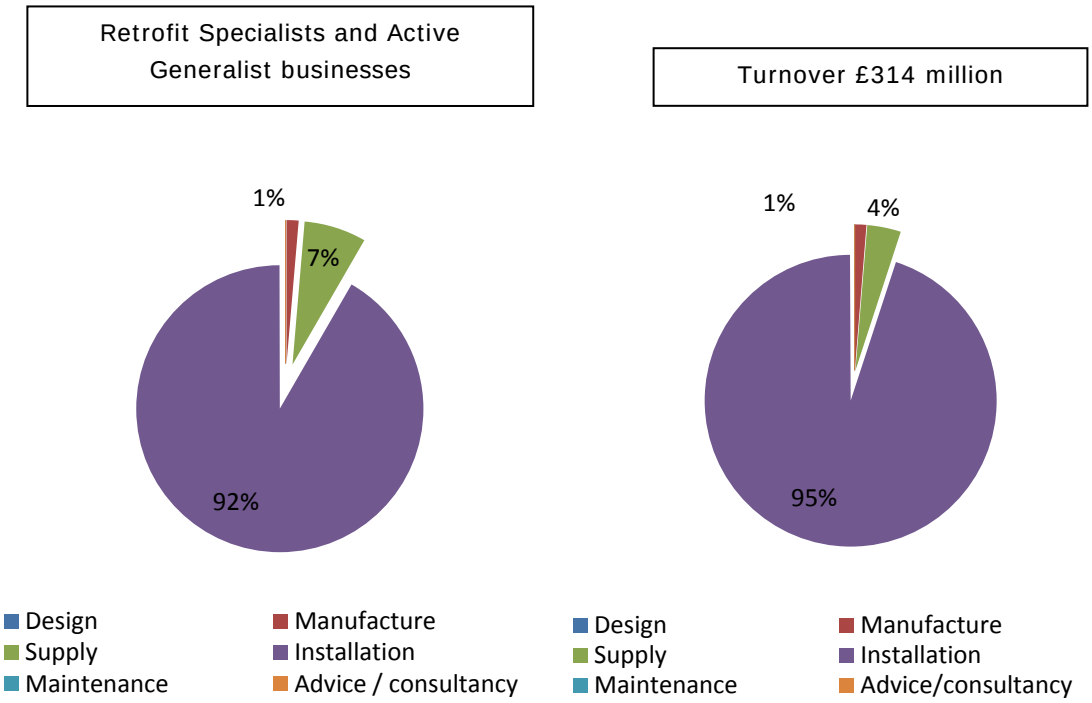
Active generalists: There are a further 2,208 generalist sub-sector businesses working specifically within the traditional energy efficiency subsector, 90% of which are also involved in installation, 8% are manufacturers and 2% are involved in maintenance, as shown in Figure 18. The group of installers include electrical contractors who get involved in energy efficient lighting, heating controls and voltage optimisation, Gas safe registered engineers who install boilers and loft conversion businesses who get involved in loft insulation work. This group of businesses report that they are able

[77] The final 1% focus on the maintenance, mainly of boilers.

to do this type of work and sometimes deliver this work, but it usually does not form their primary focus. The manufacturer group consists of businesses that produce windows and doors.

Passive generalists: There are also a large proportion of passive generalists that identify themselves as undertaking some activity to support traditional energy efficiency measures. These include over 500 architects that include measures such as loft insulation and boilers into wider property improvement work and building contractors that manage general building work and who may sub-contract work to accredited installers.

Figure 18: Proportion and turnover of retrofit specialist and active generalist TEE businesses working at supply chain stages



For traditional energy efficiency, for analysis purposes the specialist and 'active generalist' sub-sectors have been combined. This is because review of the organisations within both groups revealed that many organisations offered specialist traditional energy efficiency services amongst other buildings services (e.g. general building, plastering etc.), therefore the distinction between groups was not helpful[78].

[78] The specialist sub-group mainly consisted of businesses with similar services to active generalists, but were smaller in size and offered fewer other services.

10.3 Traditional energy efficiency value chain analysis

The study findings were used to provide an analysis of the value chain for the traditional energy efficiency supply chain, informed mainly by the qualitative research.

The total turnover specific to the traditional energy efficiency sector is estimated to be £314 million. The private owner occupier and social housing markets are where significant retrofit activity occurs. As these markets operate in different ways, separate diagrams have been produced. As with other sub-sectors, it was not possible to accurately quantify the scale of retrofit activity between these markets, but the qualitative research strongly indicated that most market activity is being undertaken in the private market. Due to policies such as the decent homes standard, social housing has been a key target for traditional energy efficiency measures for many years, which means the opportunities in this market are now limited.

There is currently very little demand or activity in the private rented market, so this was excluded from the research[79].

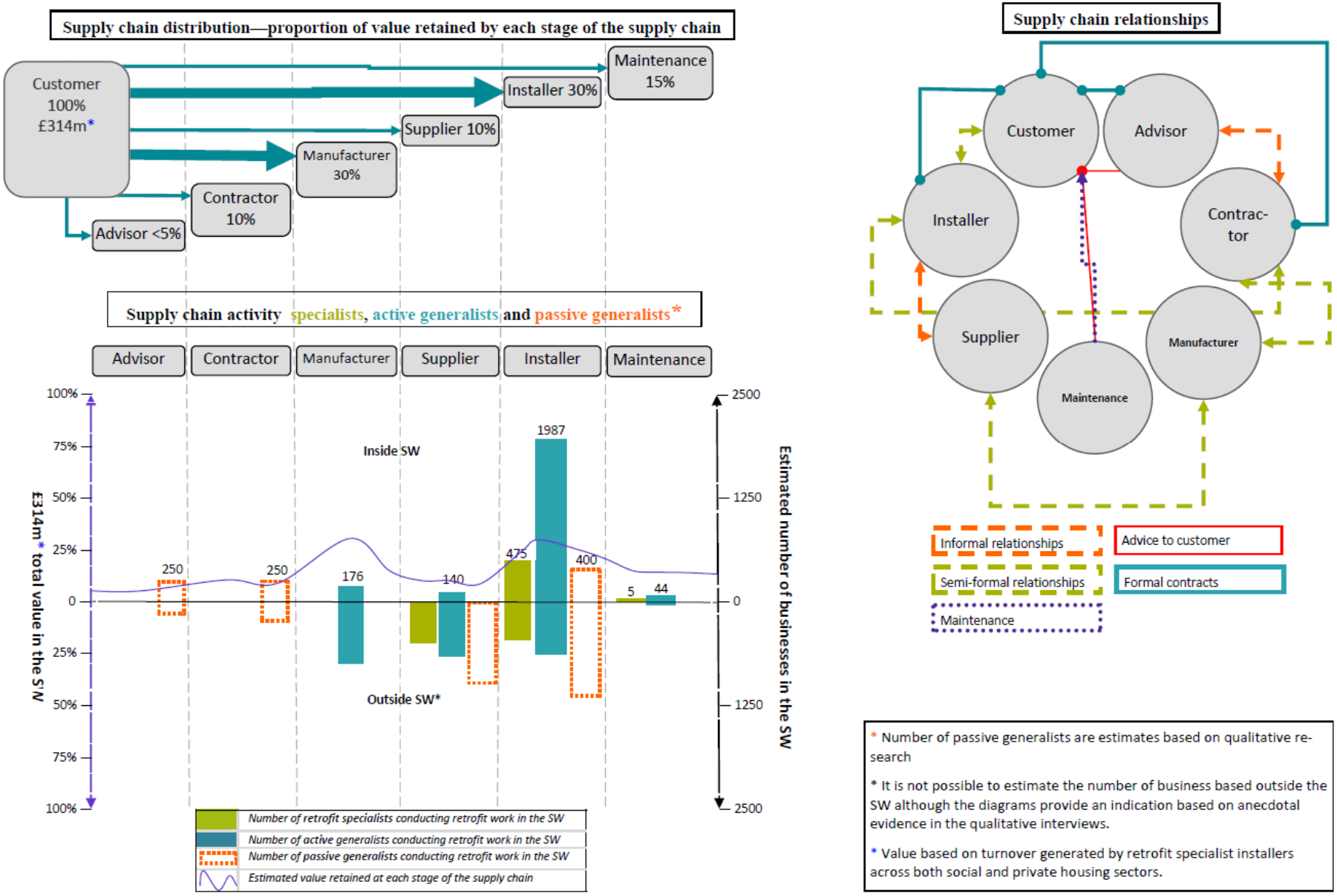
The value chains are each made up of three diagrams:

1. The first diagram shows the value distribution from the customer (social landlord or private sector owner-occupier) to each of the stages of the supply chain as a proportion of the total value of traditional energy efficiency work commissioned in the south west. The width of the arrow provides an indication of the proportion of the value and an approximate proportion (to the nearest 5%) is included. This was based upon the qualitative evidence collected in this study.
2. Through the vertical bars, the second diagram provides an indication of the level of activity in terms of the number of businesses delivering traditional energy efficiency work in the south west.
   - The diagram shows that there are businesses based inside and outside the south west delivering work within the region.
   - An estimate of the number of businesses in the south west working at each supply chain stage (split by retrofit specialist, active generalists and passive generalists) is provided, based on the estimates generated by this study and the qualitative evidence.
   - It was not possible from this research to identify the number of businesses working for individual markets e.g. social or private housing, so the figures provided are the number of businesses delivering traditional energy efficiency work for both private and social housing sectors.
   - It should also be noted that the number of passive generalists are solely based on the qualitative research and are an indication only.
   - The number of businesses outside the south west is based on the qualitative interviews with businesses in the south west in this study and are therefore only indicative.

   The purple curved line provides an approximate indication of value retained by each stage of the supply chain and the extent to which this is retained by businesses inside or outside the south west.
3. The third diagram shows the nature of the relationships between businesses at each stage of the supply chain, including:
   - Who provides advice to the customer
   - The key parties involved in main retrofit contracts
   - Where frameworks or preferred supplier lists exist
   - Where there are less formal relationships between businesses at different stages of the supply chain.

[79] See literature review for further details.

Figure 19: Value chain analysis for traditional energy efficiency (social housing)

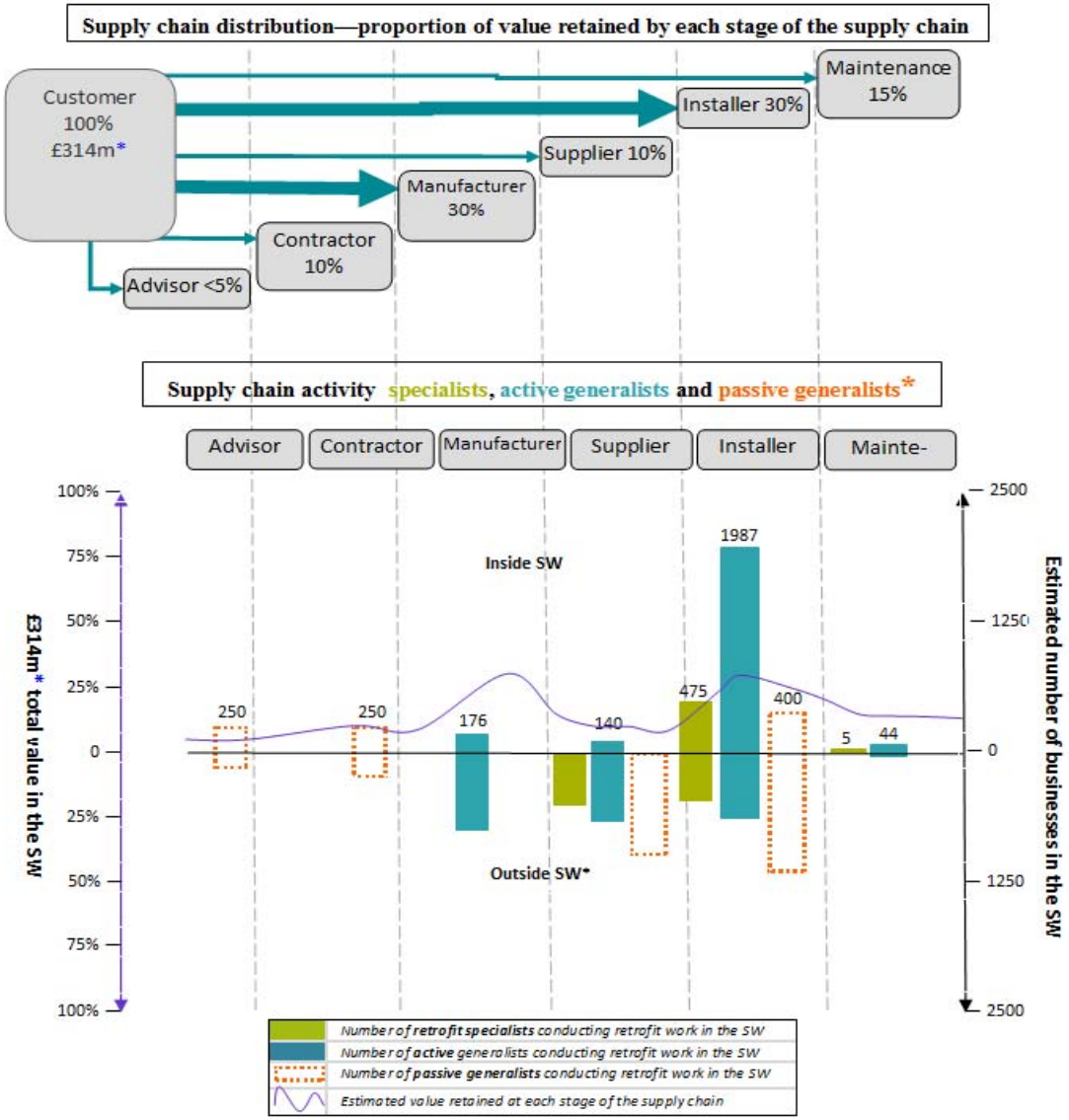


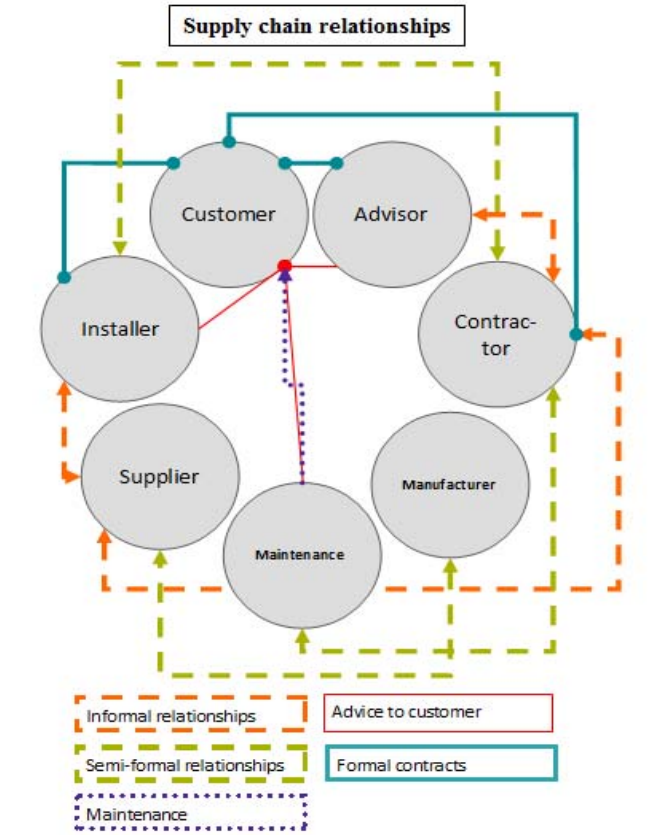
* Number of passive generalists are estimates based on qualitative research

* It is not possible to estimate the number of business based outside the SW although the diagrams provide an indication based on anecdotal evidence in the qualitative interviews.

* Value based on turnover generated by retrofit specialist installers across both social and private housing sectors.

Figure 20: Value chain analysis for traditional energy efficiency (private housing)





* Number of passive generalists are estimates based on qualitative research

* It is not possible to estimate the number of business based outside the SW although the diagrams provide an indication based on anecdotal evidence in the qualitative interviews.

* Value based on turnover generated by retrofit specialist installers across both social and private housing sectors.

10.4 Measures installed in the traditional energy efficiency sub-sector

The main traditional energy efficiency measures in the south west, in terms of level of activity, are cavity wall insulation, loft insulation and boiler replacement. There is also some activity related to other measures including; control and monitoring systems, heating controls, energy efficient lighting and voltage optimisation.

10.5 Customer demand

Businesses in the supply chain are conducting traditional energy efficiency work for both the social and private sectors. Table 10 draws on the data from across the research to summarise the main drivers for each market for traditional energy efficiency measures.

Table 10: Demand drivers for social and private housing markets

Measures	Social housing	Private (owner occupiers)
Cavity wall insulation Loft insulation Condensing boilers Glazing Control and monitoring systems Heating controls Energy efficient lighting Voltage optimisation	Limited demand – most social housing properties have already had CWI / loft insulation, and energy efficient boilers from previous funding schemes (such as CERT and CESP.) However where there are still gaps RSLs view these measures as cost-effective ways of reducing carbon. ECO funding can support the cost of these measures. RSLs report a rolling upgrade programme for glazing, replacing them every 10-15 years, which contributes to meeting Decent Homes Standard indicating that there is regular demand for improved glazing. The study found little demand reported by RSLs for control and monitoring systems, heating controls, energy efficient lighting and voltage optimisation. The main reason for this is there is no funding available for these measures.	The main drivers for the private owner occupier market taking up traditional energy efficiency measures are; desire to improve the comfort and appearance of their homes, and the desire to save money on energy bills. ECO can support the cost of CWI, boiler replacement and loft insulation for eligible households, but activity has been low since 2013 due to the change from CERT/CESP to ECO resulting in a significant drop off in activity. GD cash-back available for other measures to support costs. Interviews with the supply chain and existing research[80] suggests that the market for double glazing is saturated.

The sections below discuss the findings in relation to how the social and private housing markets commission traditional energy efficiency work.

[80] Element Energy Ltd. & Quantum Strategy and technology Ltd. (for EEPH), *An assessment of the size of the UK household energy efficiency market* (2008)

10.5.1 Social housing

Demand: There is only limited demand for most traditional energy efficiency measures as social landlords claim to have undertaken action (funded through EEC and CERT) on much of their eligible stock already.

Scale: Regarding insulation measures, of social landlords reporting[81] to still have stock that is still in need of improvement, this is estimated to be less than a tenth of their portfolios. There is anticipated to be a renewed focus on this during ECO which promotes uptake of traditional measures alongside intensive energy efficiency work. For measures such as glazing and boilers, landlords have rolling upgrade programmes acting on up to 10% of the stock on an annual basis. Furthermore, controls and lighting measures (amongst other energy efficiency checks, undertaken by maintenance teams) are tackled when there is vacancy between tenancies.

Funding: Interviewed social landlords were assessing the viability of ECO funding to support the cost of traditional energy efficiency measures alongside other properties that will receive intensive EWI / IWI work. Respondents reported that ECO providers advised them to include a blend of these measure types to achieve better value for money and a greater proportion of funding, although most landlords were too early in the process to provide exact figures. There are two approaches that landlords take to access the ECO funding, which is similar to intensive energy efficiency measures:

1. Commissioning the work to a contractor who manages the work and sells the carbon to the energy company
2. Commissioning work to an ECO provider who manages and delivers the work.

The majority of landlords interviewed suggested that they were confused as to which approach to take and often felt that they didn't have enough information (e.g. advantages and disadvantages and risks) to make clear decisions, which was holding up progress.

10.5.2 Private owner occupier market

Demand: With regards to businesses in the supply chain who are delivering work for the private housing market, respondents stated that rising fuel prices are the biggest current driver to owner-occupiers taking up traditional energy efficiency measures. This is has changed markedly from 2012, where suppliers were the main market driver due to the need to meet targets under policies such as CERT.

Scale: As described above, the scale of installation of traditional energy efficiency measures[82] was previously driven by policies such as CERT and Warm Front, and delivered over 100,000 measures per year in the south west[83]. The transition to ECO and Green Deal in January 2013 has resulted in a significant drop in uptake of measures[84] in 2013. Respondents in the market predict that the drop off has both short term and long term aspects:

- Short term as the market responds to the new, different requirements of ECO, which will recover (and potentially increase) in 2014
- Longer term as eligibility criteria for 'able to pay' householders transitions over to the Green Deal, which is suffering from low take up nationally and in the south west.

[81] Two of seven social landlord interviews (of which one noted potential was only limited to future where insulation (e.g. loft) needed replacement.
[82] Including insulation, heating measures, lighting (discontinued during CERT).
[83] Over the life of CERT, Energy Saving Trust HEED online reports.
[84] Both reported by interviewed installers, insulation manufacturers and energy suppliers, corroborated by Ofgem national figures (December 2013 ECO progress update).

Green Deal: To the end of November 2013, there had been 458 completed Green Deals UK-wide (regional data unavailable)[85].

For measures such as boilers[86], glazing[87] and lighting, there is a mature private market, largely unsupported by policies which have shown continuing demand.

Commissioning works: There are two main routes leading to traditional energy efficiency work being commissioned in the private housing market:

1. If a home owner is specifically interested in energy efficiency improvements they seek out an installer direct, or (more recently) a green deal assessment, where an assessor will visit and make recommendations on appropriate measures
2. Where home owners undertake energy efficiency improvements as part of wider home improvement works such as a renovation or extension. Here works are often undertaken to meet building regulations requirements (part L), or by recommendation to improve energy efficiency by the contractor. The work would be commissioned through a small local building contractor who may sub-contract to a local installer[88].

Funding: Householders meeting certain eligibility criteria can access ECO funding for measures through the three streams of the obligation[89]. There is a specific focus on

- Undertaking cost effective traditional measures[90] as part of packages of measures which include intensive energy efficiency measures (Carbon Emissions Reduction Obligation).
- Undertaking insulation in areas of low income (Community Obligation). This stream has a sub-target which states that at least 15 per cent of the target must be met by promoting measures to low income and vulnerable households in rural areas, which is likely to help drive additional uptake in the south west.
- Undertaking insulation and heating measures for low income and vulnerable households (Home Heating Cost Reduction Obligation).

As described above, ECO's focus on intensive measures and low income households has meant less direct funding is available for 'able to pay' owner occupiers, which are now supported by the green deal. Other measures (e.g. heating, glazing and lighting) are fully funded by the householder[91].

10.6 The role of advice in the supply chain

The study estimates that approximately 600 businesses in the south west provide advice within the retrofit supply chain, including architects, surveyors and consultants. The majority of this group of businesses (94%) say that they are able to advise customers specifically on traditional energy efficiency measures, but in most cases this is not the core purpose of their work. In most (>90%) cases the advisor will design renovation or extension works and suggest energy efficiency improvements as a minor part of the works.

[85] DECC Green Deal statistics December 2013.
[86] UK-wide boiler sales in 2011 were 1.6 million (Heating and Hot Water Industry Council market figures), using a household average split this equates to approximately 140,000 boiler sales per year in the south west.
[87] No regional or UK sales could be found for glazing.
[88] For example if they do not possess the skills and capacity in-house.
[89] Specific details are available from Ofgem https://www.ofgem.gov.uk/environmental-programmes/energy-companies-obligation-eco.
[90] E.g. Cavity and loft insulation.
[91] This can be financed through the Green Deal, which includes 44 measures, including most traditional energy efficiency measures.

Social housing: Social landlords reported that they rarely seek external advice about traditional energy efficiency measures, mainly as they have a good awareness, understanding and experience of them compared to other retrofit work. However, once they have decided which measures to install they may seek informal advice from installers, suppliers or contractors about which specific products to choose. Social landlords reported that their main considerations when commissioning works include price, value, and maintenance requirements.

Private owner/occupier market: Respondents reported that owner occupiers seek out and receive advice through various routes including:

When installing measure(s) where energy efficiency improvement is the main driver:

- Conducting research on the internet and sources such as the Energy Saving Advice line or local advice giving organisations (e.g. councils and local energy advice services[92])
- Being targeted by ECO providers seeking energy efficiency potential in local areas
- Accessing a Green Deal assessment.

Installers and other interviewees reported a recent drop in activity as a result of a decrease in proactive activity by suppliers (post-CERT) and also a longer term lack of proactive Government supported communications, either locally or nationally (e.g. from the Energy Saving Trust).

Green Deal Assessments: The Green Deal ORB[93] lists 48 Green Deal assessors based in the south west region. Approximately 4000 Green Deal Assessments had been conducted in the south west up to June 2013, approximately 80% of which were in the private owner occupier market. The assessment will provide recommendations of the most appropriate measures that will improve the energy efficiency of their home, and only those that meet the Green Deal Golden Rule.

Where measures are part of a wider scheme of works (e.g. renovations): Here an architect, builder or installer may advise on traditional energy efficiency improvements that could, or need to be delivered as part of the work[94]. This group of businesses reported that while they are willing and able to provide this advice they are sometimes reluctant to do so in case it puts the customer off from using them as the customer perceives the businesses is trying to increase the cost of the work. The supply chain report that in the majority of their work, a small proportion (10% or less) will result in uptake of traditional energy efficiency improvements.

10.7 Manufacture of traditional energy efficiency measures

The study did not find any specialist businesses that specifically manufacture traditional energy efficiency measures within the south west. However, there are approximately 180 businesses in the south west that are involved in manufacturing activity related to traditional energy efficiency measures. This includes glazing and joinery businesses that are involved in manufacturing / assembling windows and doors.

10.8 Supply

The study estimates there to be approximately 440 businesses supplying traditional energy efficiency measures based in the south west, including trade merchants who supply to local builders, installers

[92] Such as the Energy Advice service provided by the Centre for Sustainable Energy.
[93] http://gdorb.decc.gov.uk/Pfind-a-green-deal-supplier/advanced
[94] E.g. as required by building regulations.

and retail direct to householders. This group tend to be generalists, which supply across all sub-sectors of the market.

In addition, other supply routes are common for traditional energy efficiency measures, including installers buying directly from manufacturers. Table 11 lists the traditional energy efficiency measures and for each, how they are typically supplied, based on verbatim comments provided by supply chain respondents in the survey.

Table 11: Traditional energy efficiency measures and how they are usually supplied

Measure	How they are supplied
Cavity wall insulation	Preferred suppliers through merchants or distributors.
Loft insulation	Trade merchants (and DIY stores) for general public and installers / builders.
Condensing boilers Control and monitoring systems Heating controls	Installers have links directly to manufacturers / merchants / distributors. Installers sometimes exclusively use the products from one manufacturer, as a result of training provided by the manufacturer[95].
Energy efficient lighting	Supplied through trade merchants (and DIY stores) for general public and installers.
Voltage optimisation	Through installers.

10.9 Installation

The study estimates there to be just under 2500 specialist and active generalist installation businesses in the south west, which generate approximately £300 million in turnover.

These include:

- Insulation installation businesses (CWI and loft)
- Building contractors involved in energy efficiency retrofit
- Heating engineers who install boilers and heating controls
- Electrical engineers (voltage optimisation and lighting)
- Glazing installers.

As this is the first time this study has been conducted, it is not possible to provide historical comparisons on these figures, although several respondents reported that numbers of businesses and turnover is likely to have dropped. One interviewed insulation manufacturer (acting as a major supplier to the region) stated that sales of insulation in all areas, including the south west had drastically reduced as a result of the policy changes, which had resulted in job losses for installers. This would result in a future skills and capacity issue if and when demand increased again.

Green Deal certification: The number of businesses certified to conduct Green Deal work through the Green Deal oversight and registration body (Green Deal ORB) is significantly lower than total market figures, as shown in Table 12.

[95] It was not possible to quantify the extent to which this was occurring in the market, but it is a known feature of these markets, where manufacturers provide training in return for promotion of their products.

Table 12: Green Deal certified installers of traditional energy efficiency measures[96]

Measure	Number of Green Deal accredited installers in the south west (Green Deal ORB)
Cavity Wall insulation	31
Loft insulation	43
Gas condensing boilers	80
Oil condensing boilers	8
Heating controls	74
Lighting	14

The main reasons why businesses haven't become Green Deal certified yet were stated to be because they didn't think there would be enough customer demand and that accreditation took time and costs to obtain so it wasn't (yet) worth the effort.

Social housing: Within the social housing market the installation of traditional energy efficiency measures could be delivered in any of the following ways:

- By a main contractor (outside the south west) who would then sub-contract the majority of the work to local installers. This is particularly likely if the works are funded through ECO.
- By local SME installers, listed as an RSL preferred suppler
- By the RSL's internal maintenance department[97].

Private owner occupiers: Within the private housing market, the installation of these measures could be installed by:

- Local installers either directly commissioned by the owner occupier or via a local builder or contractor
- By a main contractor or ECO provider, if the work is funded through ECO
- Some owner-occupiers may do work themselves (e.g. DIY loft insulation, lighting).

10.10 Maintenance

The study found only one business actively specialising in maintenance activity[98], mainly as this tends to be undertaken as an additional activity offered by installers. In the social housing market, maintenance activity could be delivered by an internal maintenance department or by local businesses that are on preferred supplier lists or frameworks. In this case the business is likely to deliver the work through a long-term maintenance contract with the RSL.

10.11 Barriers within the traditional energy efficiency supply chain and opportunities to overcome them

The research provided insights on a number of key barriers affecting market uptake, which are reported here alongside discussions with respondents as to what actions may help overcome barriers to facilitate future market growth. These include:

[96] Green Deal ORB figures.
[97] It was out of the scope of this research to estimate the value of activity that is conducted by internal RSL maintenance teams, and this activity is not included within any of the figures cited in this research
[98] A boiler maintenance company.

1. **Lack of demand**: There is an overall reported lack of demand in the market for traditional energy efficiency measures such as insulation. The reasons for which differ between private and social housing markets:

- *For the private market, this is mainly due to a drop in proactive supplier-led drive for energy efficiency measures, and (to a lesser extent) a drop in opportunity, due to previous take up of measures.*
- *For the social housing market, this is mainly due to lack of opportunity as the sector has already undertaken significant programmes of works on eligible properties.*

There are a number of opportunities to increase demand in the short and medium term. Some of this is likely to happen anyway, where targeting of vulnerable and low income private sector householders is likely to significantly increase as a result of ECO targets[99]. However, there are many opportunities to promote and support action in the 'able to pay' owner occupier market to counter the drop off in activity here. In the social housing market, it is thought that ECO will drive take up of any remaining potential, as energy suppliers look for the most cost effective ways to deliver on their targets.

Short term:

- *Encouraging the supply chain to work increasingly with local and national groups and campaigns to raise awareness in the market. In particular supporting national, local Government and third sector supported campaigns would help, as these messages are more trusted. In addition, there are local partnerships*100 *and community energy groups, which would help increase awareness, and are known to be better able to target hard to reach groups*[101]*.*
- *Facilitating energy suppliers and ECO providers to identify and negotiate viable programmes of work with the social housing market.*

Medium term:

- *Influencing government to develop the green deal to increase its attractiveness and market viability. This includes further support and marketing of the Green Deal cash back scheme to increase the level of subsidy for measures, which are difficult to generate demand for.*

2. Skills and capacity in the market: The drop in demand since the end of CERT has resulted in a decrease in capacity and skills in the market. Actions to overcome this barrier include:

Short term:

- *Working with traditional energy efficiency installers to help them prepare for future forecasted increases in works in 2014.*
- *Encouraging the installer market to become green deal certified installers (using available support, such as Ready for Retrofit programme business support) to take advantage of this market, if and when demand increases.*

Medium term:

- *Influencing Government to provide greater long term certainty in energy efficiency policy to improve confidence in the market. This is likely to encourage investment in skills and capacity in the market.*

[99] Note, this research was undertaken prior to the November 2013 Government announcements that there may be changes to the ECO targets.

[100] E.g. energy efficiency partnerships run by south west Local Authorities.

[101] As reported in the DECC LEAF evaluation (due to be published in 2014).

3. **Reaching eligible private sector occupants for ECO funded measures (CWI, loft insulation, boiler replacement).** Local authorities report significant challenges in targeting vulnerable and low income private housing occupants for ECO funded measures.

Actions to overcome this barrier include:

Medium term:

- *Assist with a co-ordinated approach (e.g. third sector organisations) to make the process of finding eligible occupants for ECO. The community energy sector in particular have a track record in accessing these householders, so opportunities to link up work with them should be explored*[102].

4. **Supply chain-led market activity:** Advisors and building contractors report that they do not provide as much advice on energy efficiency measures to influence take up, due to concerns that it will put off customers.

There are opportunities to overcome this, by providing tools and encouragement to ensure advice is provided, and that customers can have trust in it. Actions to overcome this barrier include:

Medium term:

- *Provide marketing and communication support to the supply chain to market energy efficiency improvements, for example how to communicate/ sell the benefits of different measures to different types of home-owner. Some simple actions, such as providing tools for the trade to sign post to independent sources of advice (e.g. the Energy Saving Advice line) would help encourage uptake in the market.*

5. **Procurement in the social housing sector:** Social landlords report confusion with regards to the advantages and disadvantages of different procurement routes and how best to work with energy suppliers and ECO providers to achieve best value. Actions to overcome this barrier include:

Short term:

- *Provide impartial guidance to RSLs about the various processes / ways to access ECO funding and the implications of each to RSLs are better informed and can make decisions more easily.*
- *Encourage further networking with energy suppliers, ECO providers and other social landlords who have delivered significant schemes.*

6. **Take up in the private rented sector:** The most significant remaining un-tapped potential for traditional energy efficiency measures lies in the private rented sector, as a result of well-known barriers (e.g. split incentives between landlords and tenants, fragmented landlord market etc.). Actions to help overcome this barrier includes:

Medium term:

- *Taking advantage of proposed changes in legislation (e.g. renting of F or G EPC rated homes) to engage landlords to install energy efficiency measures*
- *Engaging with landlords with large portfolios, who traditionally have been easier to engage and likely to be more inclined to improve energy efficiency of their properties.*

Long term:

- *Work with local and national Government to undertake further work to encourage energy efficiency in the private rented sector.*

[102] DECC's recent Community Energy Strategy research (due to be published in early 2014) found there to a large and rapidly evolving community energy sector in the south west.

11 Microrenewable heat

This section provides an analysis of the microrenewable heat sub-sector of the retrofit market, defined as including:

1. Air source heat pumps
2. Ground source heat pumps
3. Small-scale biomass boilers
4. Solar hot water.

11.1 Overview of the microrenewable heat sub-sector

The table below summarises the key findings from the study specific to the microrenewable heat sub-sector, which are explored in more detail in the sections below. The figures included in the table are based on the retrofit specialists and active generalist groups only.

Table 13: Overview of the microrenewable heat sub-sector

Number of businesses (approx)	1200
Turnover	£456million
Number of employees	2,000
Skills	Specialist technical skills required to install measures, and there is likely to be a shortfall in capacity when demand increases in Spring 2014. Accreditations: MCS accreditation on production of technologies and installing technologies.

11.2 Scale of the microrenewable heat supply chain in the south west

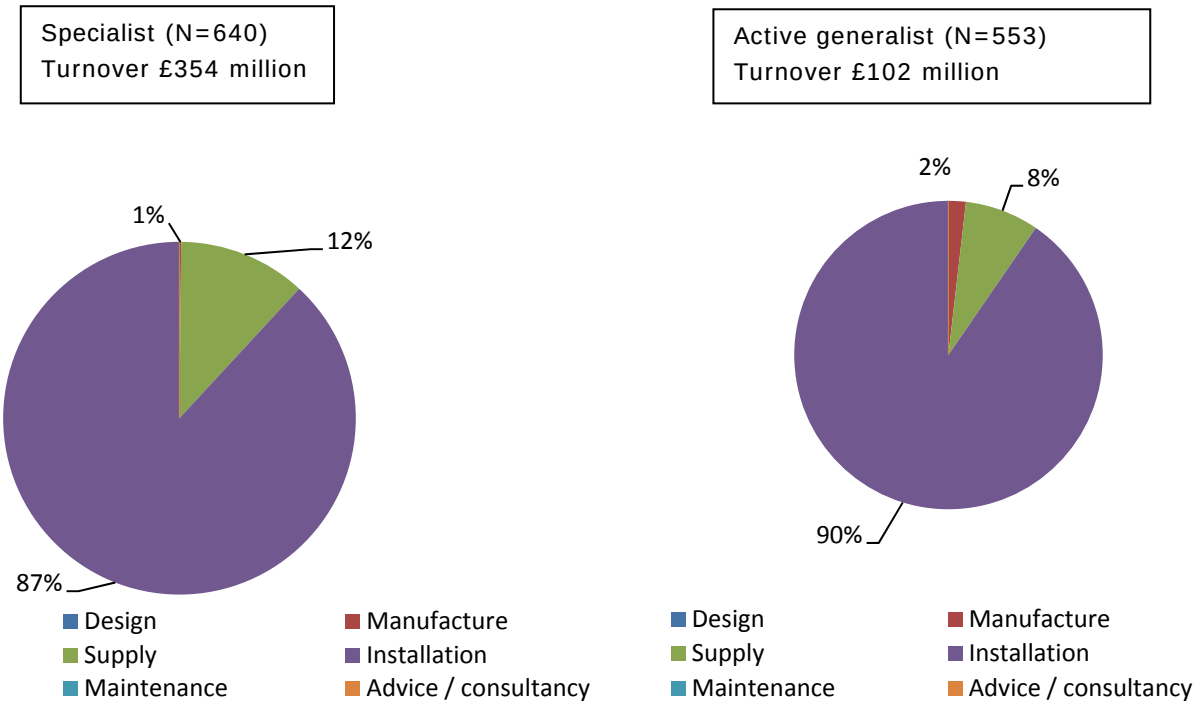
Retrofit specialists: There are estimated to be 640 retrofit specialist businesses working in the microrenewable heat supply chain, 87% of which are installers, 12% are suppliers of microrenewable heat technologies and 1% are manufacturers of microrenewable heat technologies (**Figure 21**)[103]. These are typically businesses that have MCS certification and are generating at least half of their turnover from retrofit activity in the renewable heat market.

Active generalists: There are an estimated further 550 active generalist working specifically within the renewable heat subsector, 90% of which are involved at the installation stage, 8% are suppliers and the final 2% are involved in manufacturing. The group of installers include electrical contractors and heating engineers who get involved in the installation of renewable heat technologies but are not necessarily accredited to carry out the full installation. For example this could include electrical contractors who carry out electrical work contributing to the installation of a heat pump. The group of suppliers include plumbers' merchants and other businesses that sell spare parts that go into renewable heat technologies and other heating systems.

[103] None of these include biomass fuel businesses, only equipment is included.

Figure 21: Proportion of specialist and generalist sub-sector renewable heat (RH) businesses working at supply chain stages

N.B. Turnover for installers based on data provided by Regen SW



Although it is not possible to accurately estimate number (due to small sample sizes) in this study, there is evidence to suggest that there are many more businesses in the south west involved in renewable heat technologies. These include building contractors who are managing and working on projects where renewable heat technologies are being installed, and electrical and plumbing contractors involved in ancillary works. The installation of ground source heat pumps in particular required ancillary works such as boring works and laying of pipes.

11.3 Microrenewable heat value chain analysis

The study findings were used to provide an analysis of the value chain for the renewable heat supply chain, which is illustrated here and explored in more detail in the sections below. The value chains are mainly informed by the qualitative research.

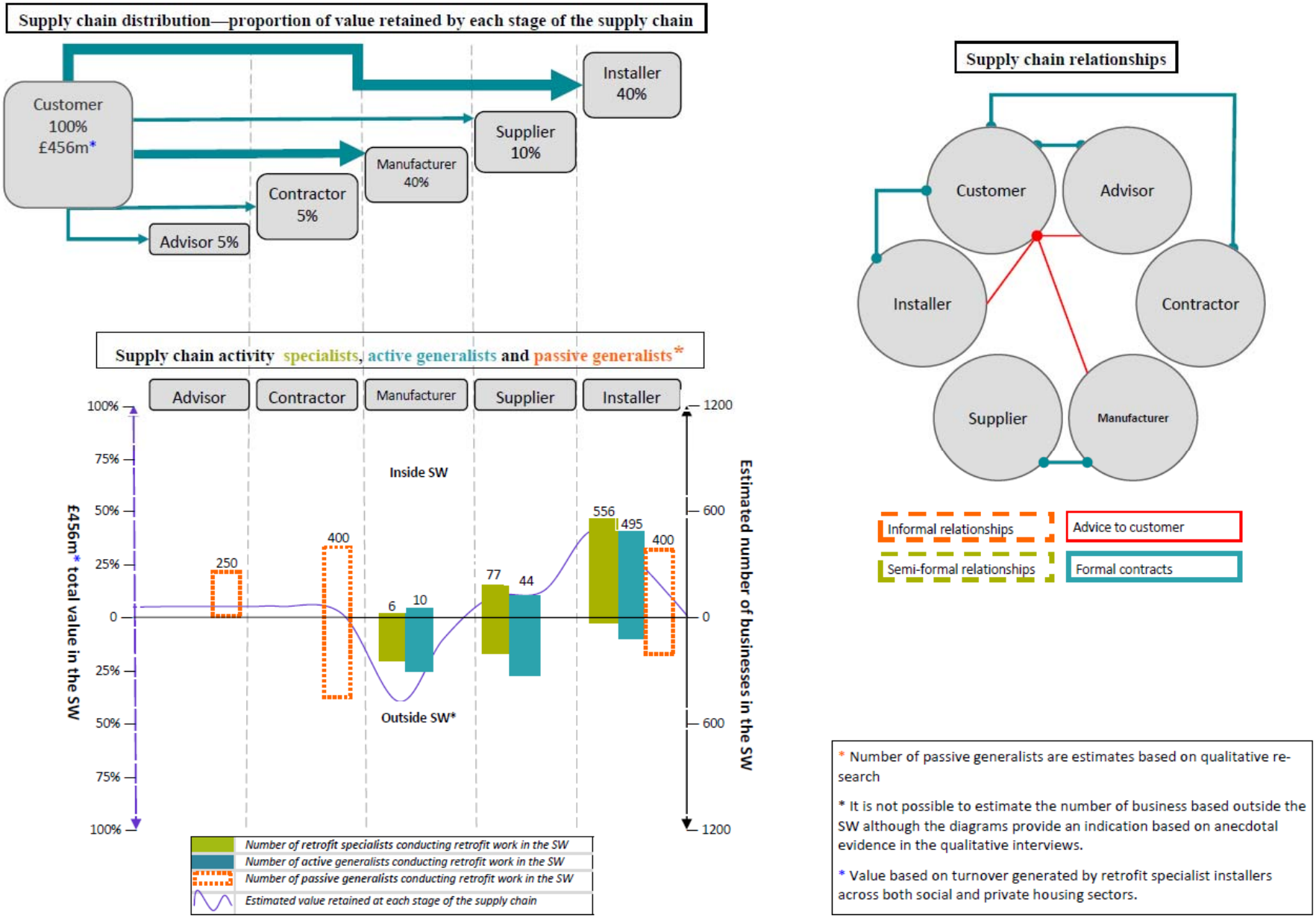
The total turnover specific to the microrenewable heat sector is estimated to be £456 million. Although accurate estimates could not be provided through this research of the activity generated by each of the private and social housing markets, the qualitative research suggests that there is higher levels of activity in the private housing sector. As the private and social housing markets operate in different ways, separate value chain diagrams have been produced for each.

The value chains are each made up of three diagrams:

1. The first diagram shows the value distribution from the customer (social landlord or private sector owner-occupier) to each of the stages of the supply chain as a proportion of the total value of microrenewable heat work commissioned in the south west. The width of the arrow provides an indication of the proportion of the value and an approximate proportion (to the nearest 5%) is included. This was based upon the qualitative evidence collected in this study.
2. Through the vertical bars, the second diagram provides an indication of the level of activity in terms of the number of businesses delivering microrenewable heat work in the south west.
    - The diagram shows that there are businesses based inside and outside the south west delivering work within the region.
    - An estimate of the number of businesses in the south west working at each supply chain stage (split by retrofit specialist, active generalists and passive generalists) is provided, based on the estimates generated by this study and the qualitative evidence.
    - It was not possible from this research to identify the number of businesses working for individual markets e.g. social or private housing, so the figures provided are the number of businesses delivering microrenewable heat work for both private and social housing sectors.
    - It should also be noted that the number of passive generalists are solely based on the qualitative research and are an indication only.
    - The number of businesses outside the south west is based on the qualitative interviews with businesses in the south west in this study and are therefore only indicative.
      The purple curved line provides an approximate indication of value retained by each stage of the supply chain and the extent to which this is retained by businesses inside or outside the south west.
3. The third diagram shows the nature of the relationships between businesses at each stage of the supply chain, including:
    - Who provides advice to the customer
    - The key parties involved in main retrofit contracts
    - Where frameworks or preferred supplier lists exist
    - Where there are less formal relationships between businesses at different stages of the supply chain.

The sections following the diagrams provide a written commentary of the value chain analysis.

Figure 22: Value chain analysis for microrenewable heat (social housing)

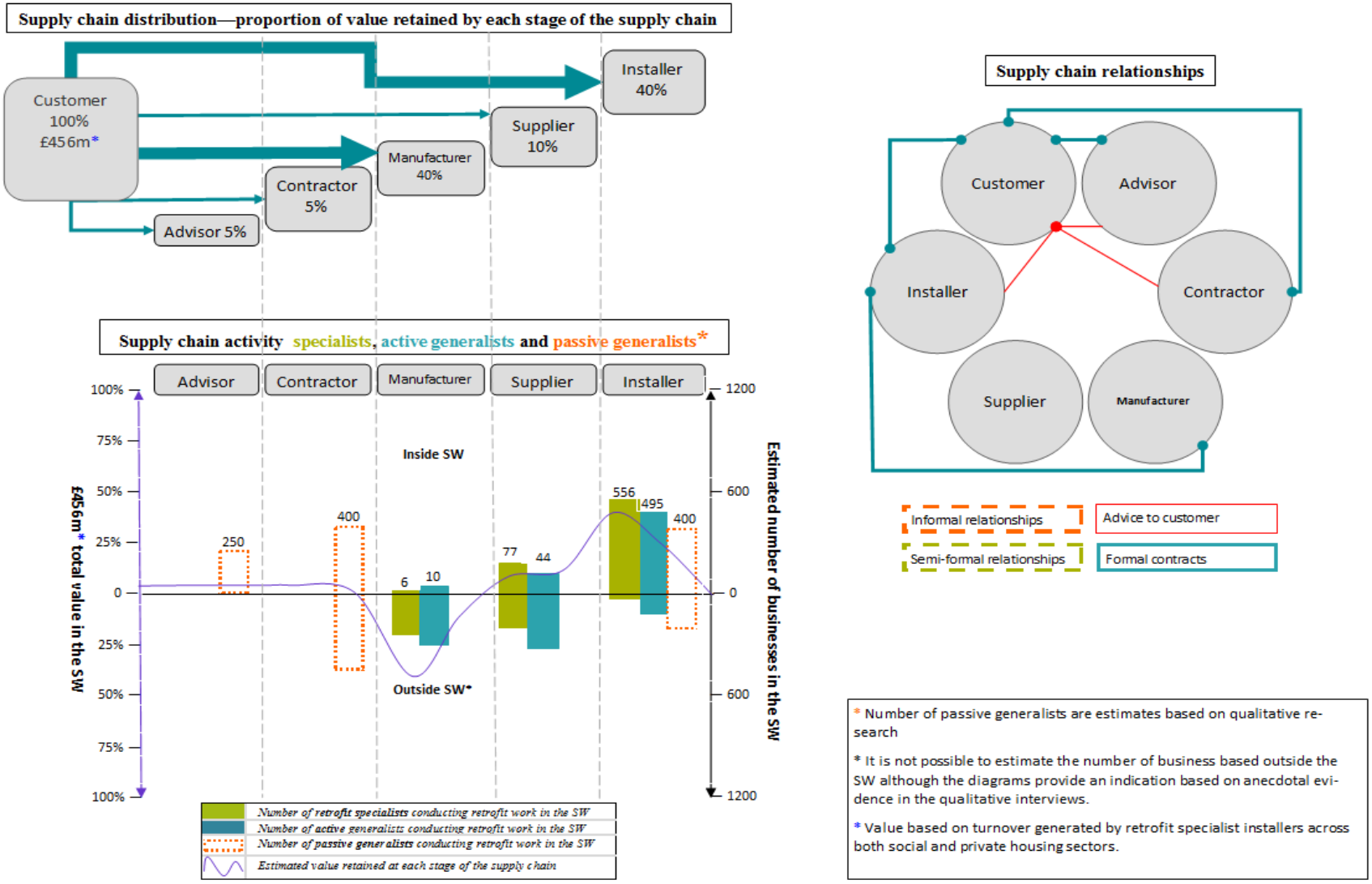


* Number of passive generalists are estimates based on qualitative research

* It is not possible to estimate the number of business based outside the SW although the diagrams provide an indication based on anecdotal evidence in the qualitative interviews.

* Value based on turnover generated by retrofit specialist installers across both social and private housing sectors.

Figure 23: Value chain analysis for microrenewable heat (private housing)



* Number of passive generalists are estimates based on qualitative research

* It is not possible to estimate the number of business based outside the SW although the diagrams provide an indication based on anecdotal evidence in the qualitative interviews.

* Value based on turnover generated by retrofit specialist installers across both social and private housing sectors.

11.4 Customer demand

The south west is known as having a more mature domestic microrenewables market than other parts of the UK, as a result of a number of factors including:

1. A significant proportion of rural, off-grid properties (approximately 400,000, 17% of total households[104])
2. Active supply chain and community energy sectors.

There is activity in both the social and private housing markets, of similar scales in terms of total numbers of installations, which means there is significantly greater activity per household in social housing. Businesses in the renewable heat supply chain cite high levels of interest for renewable heat technologies, driven both by the RHPP scheme, but more so by to the upcoming launch of the RHI in spring 2014. The drivers for both social and private housing markets are outlined in Table 14 and discussed further in the sections below.

Table 14: Demand drivers for renewable heat technologies in the social housing and private owner-occupier housing markets

Renewable heat technology	Social housing	Private housing (owner-occupier)
Ground source heat pumps	**Increasing demand –** for off-gas, rural properties in multiple batches of properties to improve comfort and reduce bills, taking advantage of support available (RHPP).	**Some demand -** Particularly for off-grid, rural properties driven by security of supply, reduction in energy bills, thermal comfort. Level of interest hasn't materialised into confirmed sales yet, but is expected to increase with the RHI.
Air source heat pumps	**Increasing demand –** for off-gas properties in multiple batches of properties to improve comfort and reduce bills, taking advantage of support available (RHPP).	**Some demand** through RHPP, similar drivers to GSHP[105] Expected to increase when the RHI is introduced.
Small scale biomass	**No demand –** RSLs are not considering individual biomass boilers for their housing stock as viewed as unsuitable for tenants and require significant maintenance. Some community biomass interest[106].	**Significantly increasing demand –** significant recent interest in biomass boilers in the owner-occupier market driven by energy costs and thermal comfort. Limited activity under RHPP, but interest expected to convert into significant sales when RHI launched.
Solar hot water	**Limited demand**- a minority of social landlords considering SHW alongside solar PV installations.	**Limited demand** –some steady demand for SHW in the private owner-occupier market expected to increase on launch of the RHI[107].

[104] Approximately 17% of total households (2.3 million) Energy Saving Trust Home Analytics tool.
[105] Often considered when GSHP are not practical, and/or due to their lower costs.
[106] Outside the scope of this study.
[107] Supported by 2013 changes to the deeming methodology to improve the rate of return, alongside confirmation of the 19.2p/KWh.

11.4.1 Social housing market

Heat pumps: The greatest level of demand in the social housing market is for heat pumps, and based on respondents' views, there were roughly equal proportions of interest for ground source and air source technologies.

Biomass: Of the social landlords engaged in the research, none had installed or were considering the installation of small-scale biomass boilers for individual properties. They felt that the technology was too expensive, required too much maintenance work and caused problems for tenants in getting suitable fuel. Two RSLs did mention their interest in community scale biomass, but this was out of scope for this study.

SHW: Finally, one respondent noted interest in exploring installation of SHW alongside solar PV arrays, but otherwise the technology was of less interest as the benefits were not as great.

Scale: Social landlords reported undertaking significant heat pump projects, including both as they consider them to be a good way to improve thermal comfort and reduce fuel bills, especially for properties off the gas grid. Landlords reported undertaking initial feasibility work, and then proceeding to install the technologies in batches of properties (e.g. 10-25 at a time). One respondent reported having undertaken over 300 ASHP installations to date.

Funding: There have been some good sources of funding for renewable heat to date for social housing provided through Government initiatives such as the Renewable Heat Premium Payment scheme (RHPP), which will in future evolve into the RHI. National RHPP figures show that five south west social landlords have received funding through the RHPP social housing phase two competitions[108]. In future, landlords are expecting the RHI to provide an income which they can then use to support the cost of other energy efficiency improvements across their stock.

Commissioning work: Social landlords reported they were developing lists of preferred suppliers and / or frameworks to commission work to. How the work is procured would depend on the size of projects, as for other sub-sectors. Smaller projects may get commissioned through preferred suppliers, whereas larger jobs (which usually include other measures) need to be procured according to EU procurement rules and more likely are won by larger contractors. Where the contract is won by a main contractor outside the south west they would usually seek to sub-contract the specialist installation of the renewable heat technology to a local installer. One respondent reported a lack of capacity in the local market for larger jobs, which resulted in venturing to other sources to satisfy demand.

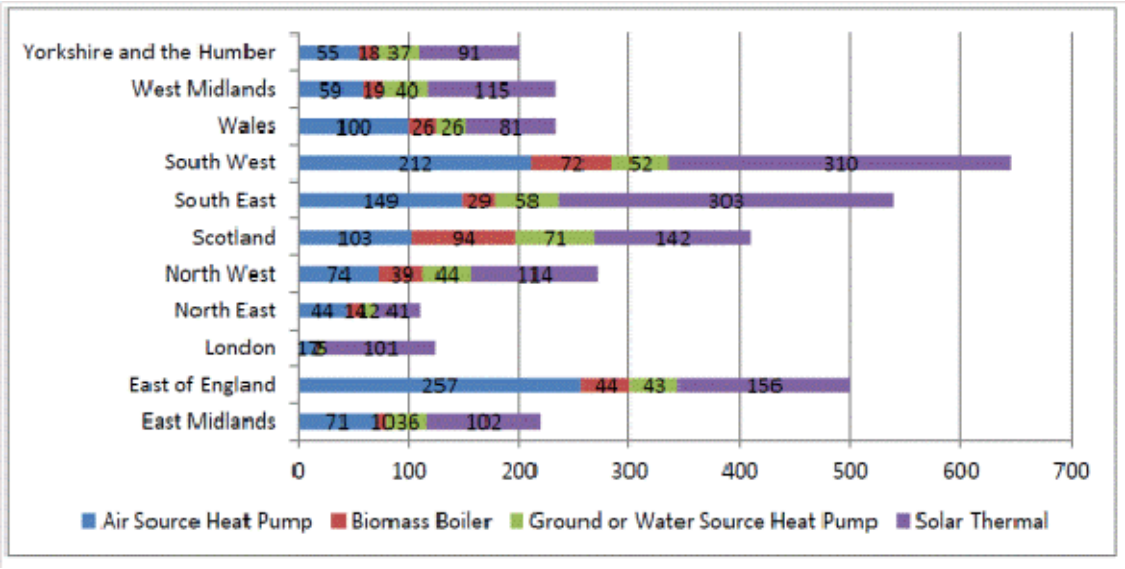
11.4.2 Private housing

Scale: This study found demand for all four technologies in the private owner/occupier market. Most technologies installed to date have been supported by the RHPP scheme, of which over 1700 technologies have been installed across both phases of the scheme[109]. Figure 24Figure 24 provides an overview of installations in the south west by technology and compared with other English regions.

Figure 24: RHPP phase 2 uptake of renewable heat measures by region

[108] Energy Saving Trust RHPP phase two social housing progress.

[109] With the possible exception of SHW, where there is some evidence of activity going ahead without the grant (e.g. by non-MCS certified installers).



Through the research, businesses in the supply chain report high levels of interest and expect this to convert into sales when the RHI is launched in spring 2014 and report investing in skills and capacity in order to meet demand when the RHI starts. In-depth interview respondents however reported that there is a lack of awareness and understanding of renewable heat measures, in particular heat pumps, which was affecting demand.

Funding: The RHI is deemed as crucial in ensuring anticipated demand turns into actual sales from 2014 onwards. At the time of the research, the RHI levels for the domestic scheme had not been confirmed, which resulted in significant uncertainty, especially considering the length of the delay in launching the domestic RHI to date. However, confirmation by DECC of the RHI tariffs in December 2013[110] will likely have increased confidence in the market.

Commissioning works: When owner occupiers consider renewable heat technologies they may seek advice from an architect, but also tend to approach the agents / suppliers / installers for advice and feasibility of the technologies. If renewable heat is part of wider works to a property, the contract may go to a local building firm, who will then sub-contract the installation of the renewable heat technology to an accredited installer. If renewable heat work is commissioned in isolation the owner-occupier will usually go straight to an agent / distributor / installer for advice, supply and installation.

11.5 Advice in the renewable heat supply chain

This study estimates that approximately 200 businesses provide advice related to renewable heat technologies, although usually this is not the core purpose of their business. This includes architects, surveyors and energy consultants.

Social housing: Social landlords reported that they would seek independent advice on the feasibility of renewable heat technologies prior to deciding whether to commission the installation of this type of technology. This would usually take the form of a feasibility study undertaken by an expert consultancy. Landlords also reported proactively contacting manufacturers and suppliers for

[110] DECC Domestic Renewable Heat Incentive: A Government Response to 'Proposals for a Domestic Scheme' September Consultation.

information about the performance of the technology and information to consider for installation and maintenance.

Private sector owner occupiers: There are several sources of advice used in the market, including:

- Contact agents, suppliers and / or installers of renewable heat technologies for information. RH installers commented that this advice / quoting process can be time consuming and expensive as the conversion rates from enquiry to confirmed sales is low (approximately 10%) as a lot of properties turn out not to be suitable for the technology and/or householders are not aware or willing to make required ancillary changes (e.g. heating system changes for heat pumps).
- Commissioning a Green Deal assessment to understand the suitability of renewable heat for their property and whether there would be funding to support the cost[111].
- Consider renewable heat as part of wider work to the property and seek advice from an architect or surveyor.

11.6 Manufacturing in the renewable heat supply chain

This study found one manufacturer of microrenewable heat technologies within the renewable heat supply chain, and who are the only UK manufacturer of heat pumps, and report to have 25% share of the UK market[112]. The majority of manufacturers of renewable heat technologies are outside the south west region. Manufacturers based outside the south west have (and continue to) set up agent / distribution networks in the region to enable them to build their market share in preparation for the RHI in spring 2014.

This study estimates there to be a further ten or more 'active generalist' businesses who are manufacturers. This group of businesses are manufacturers of wood pellets, which provide fuel for domestic small-scale biomass boilers. These businesses are generally small[113] and are often involved in non-retrofit activities such as producing biomass for other purposes[114]. There are approximately eight businesses that are Woodsure certified producers of biomass fuel based in the south west.[115]. In order for manufacturer warranties of biomass boilers to be valid, HETAS (or equivalent such as Woodsure[116]) accredited fuel must be used. Further to this, from autumn 2014 anyone wishing to receive RHI support will have to purchase fuel from an approved suppliers list, which will increase the importance of accreditation for manufacturers to comply with the approved suppliers list. Some of the smaller businesses reported that they had looked into accreditation but found the process too complicated and time consuming for a small business to undertake. The businesses are aware that customers will increasingly look to buy certified wood pellets to benefit from the warranty on their biomass boiler, and will perhaps reconsider this in future, when demand increases.

11.7 Supply / distribution of renewable heat technologies

Supply of technologies: This study estimates there to be 75 specialist suppliers of renewable heat technologies in the south west. The qualitative research suggests that suppliers fall into one of the following categories[117]:

[111] It should be noted that to date there are no renewable heat measures installed using Green Deal finance.
[112] And higher in the south west, although an estimated figure was not provided.
[113] Fewer than 10 employees.
[114] Such as sawdust for animal bedding, which is required in the winter by farmers.
[115] HETAS is UK approval body for biomass and solid fuel domestic heating appliances, fuels and services, including the registration of competent installers and servicing businesses.
[116] http://www.woodsure.co.uk/
[117] It was not possible from the research to estimate the proportion of each group

- Suppliers that sell products exclusive to one manufacturer
- Suppliers of a single technology type e.g. biomass boilers, but sell technologies made by a range of manufacturers
- Larger suppliers who supply multiple technology types and from different manufacturers.

Supply of parts: There are approximately a further 40 'active generalist' businesses supporting renewable heat technologies. These include plumbers' merchants and other businesses that sell spare parts that go into renewable heat technologies and ancillary heating systems.

Supply of fuel: The study did not find any businesses in the south west that supply biomass fuel as their principal activity[118]; all of the biomass fuel related businesses that took part in the survey reported that their principle stage of the supply chain is manufacturing, however from their verbatim we know that most of these also supply direct to the end user. This activity is therefore included under the manufacturing stage of the supply chain. However, there is one supplier of HETAS[119] accredited wood pellets based in the region[120] and there are several certified depots supplying biomass fuel registered with Woodsure[121].

11.8 Installation of renewable heat technologies

There are estimated to be 564 specialist installers of renewable heat technologies in the south west, which is similar to the number of businesses that are listed on the MCS accreditation register. Due to limited sample sizes, it was not possible to break this down further into technology types from the primary research, however Table 15 provides an approximated breakdown of the MCS register[122].

Green deal certification: There are fewer Green Deal accredited installers of renewable heat technologies. The table below provides data from the Green Deal ORB (required for installations funded through the Green Deal) and MCS register (certification required for installations receiving RHI) to show the number of accredited installers for each renewable heat technology. The numbers further support comments from installers in the renewable heat supply chain who felt that the RHI was likely to result in higher volumes of work compared to work generated through the Green Deal.

Table 15: Number of accredited installers in the south west by renewable heat technology

Renewable heat technology	Green Deal ORB	MCS accredited (approximate number)
ASHP	27	200
GSHP	31	200
Biomass	6	100
SHW	28	150

[118] All of the biomass fuel related businesses that took part in the survey reported that their principal stage of the supply chain is manufacturing, however from their verbatim we know that most of these also supply direct to the end user. This activity is therefore included under the manufacturing stage of the supply chain.
[119] http://www.hetas.co.uk/fuel/?lng=-3.530624399999965&lat=50.7381457&fuel-type=pellet&enplus=

[121] http://www.woodsure.co.uk/suppliers.htm
[122] Note the MCS register does not allow exact filtering by region, so these numbers are estimated from searching the database.

Some installers will sub-contract some of the installation work out due to the diverse range of skills required for installation. For example, one heat pump installer reported that they would carry out the heating / plumbing part of the installation but would also require electrical skills to complete the installation and so sub-contract this to a local electrician.

There are approximately 500 active generalist businesses that are involved in the installation of renewable heat technologies. This group of businesses are electrical contractors and plumbing and heating businesses who are often working alongside specialist renewable heat installers, and may carry out some of the installation work themselves. These businesses do not currently have an accreditation in renewable heat.

11.9 Maintenance

Out of the four sub-sectors, renewable heat appears to generate the greatest level of maintenance activity, and businesses in the renewable heat supply chain felt that there were often maintenance issues with the technologies. Approximately 800 businesses report to be involved in the maintenance of renewable heat technologies; these span across the specialist and active generalist groups. For both private and social housing markets, the first port of call for maintenance work is generally the business who installed the technology.

Businesses in the supply chain reported issues with dealing with maintenance problems, in particular for biomass and heat pump installations. This is complicated by manufacturers being located overseas and there being not enough skills in the market to deal with maintenance issues. Installers reported that it can take a few days to get spare parts from overseas manufacturers and access support from a help-line, which can cause frustration for the customer. This had led to negative reports in the marketplace for biomass, which could put customers off in future.

11.10 Barriers within the renewable heat supply chain and opportunities to overcome them

The research provided insights on a number of key barriers affecting market uptake, which are reported here alongside discussions with respondents as to what actions may help overcome barriers to facilitate future market growth. These include:

1. **Lack of private sector demand:** Whilst demand for renewable heat measures is growing across most technologies[123], the research reports a lack of demand in the private owner occupier sector as a result of lack of awareness and understanding of measures, in particular heat pumps.

There are a number of opportunities to increase demand in the medium term such as by increasing the level of communications and advice provided to the market. Actions to overcome this barrier include:

Short to medium term:

- *Encouraging the supply chain to work increasingly with local and national groups and campaigns to raise awareness in the market. In particular supporting national, local Government and third sector supported campaigns would help, as these messages are more trusted.*
- *Helping the market develop targeted marketing campaigns – many technologies are only likely to be taken up at specific 'trigger points', such as at the point of a major property renovation*

[123] With the exception of SHW, which is experiencing steady demand.

(e.g. where the whole heating system is replaced). Furthering understanding of the actions taken by customers in preparation for this and providing advice and information at these points will help increase uptake.

2. Concerns about technology performance (e.g. heat pumps); Social landlords reported some awareness of negative customer experiences, including poor technology performance, installation and maintenance issues, which has negatively affected demand for some measures (e.g. heat pumps). Whilst it is known that technology performance is still developing, there are opportunities to overcome this barrier by:

Short to medium term:

- *Provide impartial information regarding the performance between technologies and the key success factors to successful installation, avoiding maintenance problems, and how to educate tenants to counter ineffective use of technologies.*
- *Generate positive news stories in the media about successful renewable heat technology installations.*

3. Lack of installer capacity in the market (e.g. green deal certification): There are relatively few green deal certified installers in the marketplace, which could cause capacity issues should demand through this route increase in future. Actions to help overcome this barrier include:

Medium term:

- *Raising awareness of the business opportunity through Green Deal to appropriate businesses to encourage them to become Green Deal accredited.*

4. Maintenance issues: The supply chain is not currently well set up to provide adequate maintenance within the market. This is as a result of overseas manufactured products and agents / distributors who are not currently skilled at repairs. This barrier is likely to become less of an issue as the market matures; actions to overcome this barrier include:

Short term:

- *Encourage the use of locally manufactured technologies and products to avoid complex maintenance supply chain.*

Long term:

- *Work with industry to produce guidelines / regulations for businesses in the renewable heat supply chain to adhere to with regards to maintenance procedures and timescales.*

5. Developing a certified supply chain for biomass fuel; Whilst there are several biomass fuel suppliers in the south west, not all of them have an official certification (HETAS or equivalent such as Woodsure). This is resulting in reduced uptake of biomass installations, due to lack of supply, in particular that which is sustainably sourced and will not affect warranties. The existing market consists of small businesses, which report not having the knowledge, resources or capacity to obtain accreditations. They also do not report demand for it within the current market. There are a number of opportunities to overcome this barrier, by building capacity, skills and awareness of future demand in the market, although this is likely to be somewhat mitigated by the Biomass Supplier List when it is introduced in Spring 2014[124]. Actions to overcome this barrier include:

[124] Although suppliers will be able to register on the Biomass Suppliers List from Spring 2014, consumers will not have to purchase from registered suppliers until Autumn 2014: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263190/Domestic_budget_management_publication_-_Dec_2013.pdf

Short term:

- *Support businesses to become accredited, in order to keep the 'value' in the south west and remove this barrier to demand for this technology (which is experiencing a significant increase in demand).*
- *Demonstrating, through market communications the large increases in demand for biomass boilers, in order to convince the supply chain to respond.*

12 Summary market barriers, opportunities and actions to facilitate growth

The sub-sector analysis sections presented above provide a detailed understanding of the opportunities and barriers, which affect these sectors of the market. Despite the reported heterogeneity present in the market (and hence focus for the report), the research reveals insights in the form of barriers and opportunities, which affect the whole market, or multiple sub-sectors. This allows for summary barriers and opportunities for growth to be presented, alongside recommendations for actions which would assist market growth.

12.1 Demand vs. Supply

Both demand and supply are required in order to increase growth in the retrofit market. Almost all respondents across sub-sectors reported a sense of 'waiting for the opportunity to be realised' before taking action. This reactive behaviour is somewhat anticipated from the supply chain, for example businesses not investing in retrofit related accreditation until there is adequate demand to justify the investment. However, customer groups (e.g. social landlords) are also behaving in a reactive way, i.e. holding off from making a decision to install retrofit measures across their housing stock. This indicates that on balance, action on demand generation would facilitate market growth more in the current economic climate, and policy context.

There is also a significant opportunity to increase and develop the skills and capacity of the retrofit supply chain, particularly if the scale of retrofit work is to ramp up to meet 2020 targets[125]. Action in both supply and demand will benefit the market in the:

- Short term – to remove current existing market constraints
- Medium term – to ensure the supply chain is prepared for growth, forecast to be driven by policies such as ECO, RHI and Green Deal.
- Longer term – to ensure a sustainable long term retrofit market that no longer needs public sector support.

The sub-sections below present demand and supply chain issues separately, each including

- Key barriers
- Opportunities for growth, focused on those specific to the south west
- Short, medium and long term actions which could be taken to facilitate growth.

12.2 Demand barriers

Lack of demand is driven by two key issues:

1. **Lack of customer awareness**[126] of retrofit; key aspects of this include
   - householder awareness and understanding of technical solutions to retrofit their home, particularly evident for the renewable heat and intensive energy efficiency sub-sectors
   - awareness of support available through policies, such as ECO for intensive energy efficiency and Green Deal for all sub-sectors

[125] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/65602/6927-energy-efficiency-strategy--the-energy-efficiency.pdf.

[126] A lack of customer awareness and interest in retrofit were issues commonly cited by respondents in the supply chain

- challenges around targeting vulnerable groups[127], particularly for intensive energy efficiency measures funded through ECO.

2. **Lack of customer interest**; key aspects of this include
   - lack of understanding of and confidence in the benefits of retrofit work (e.g. energy bill savings) across all four sub-sectors
   - perceived hassle factors in arranging retrofit work and living in the property whilst retrofit work is undertaken, particularly for intensive energy efficiency measures such as solid wall insulation.
   - perceived lack of sufficient policy support (i.e. Social landlords considering retrofit solutions on their housing stock look for how much incentive they are able to get from policies such as ECO)
   - confidence in technologies/measures and potential maintenance issues, particularly for renewable heat technologies.

A further reported issue is that where there is reported demand, often it is not as effective as it could be; with examples cited of a 'measure-specific' approach taken, as opposed to whole house retrofit (taking advantage of known cost efficiencies of undertaking multiple measures at one time).

Overcoming the first issue can be achieved by increasing awareness, e.g. through communications activities either directly, or through working with customer facing partners to get the message out. The second requires a variety of actions including advice and support to help convince householders of the case for action and/or further market support to increase the attractiveness of policies, including whole house retrofit.

Across both, there are opportunities for growth in the south west, including:

1. **Increasing awareness**:
   - Take up of previous policies (e.g. CERT) has been lower in the south west than other regions, indicating that there is more opportunity for successful action in the south west (e.g. for traditional energy efficiency measures) than elsewhere in the UK[128].
   - There may also be potential to further develop partnerships (such as the Devon district councils partnership[129]) to further drive uptake of retrofit.
   - There is a very active community energy sector in the south west, reported by recent research undertaken for DECC to inform DECC's Community Energy Strategy[130], which can be a useful route to market.

Actions which would help take advantage of these opportunities include:

Short-medium term

- Providing further support for Local Authority and other partnership activities to deliver large scale private sector retrofit activities in the south west. This includes helping them to overcome targeting and engagement barriers, in particular for those in fuel poverty and the vulnerable. In the short term, further action should be taken to understand what form of support would be

[127] Noting a specific limitation of the research, which was that householders were not included within the scope, so a reliable assessment of demand from this sector was not possible to glean. Insights are qualitative, and based on interviews with supply chain respondents.

[128] This is known to be due to issues such as the relative rurality of the region, which has meant it has been less cost effective to deliver such policies in the south west than elsewhere. However, due to a drying up of opportunity in other regions, this may change in future.

[129] Which includes eight district councils across Devon.

[130] Evidenced through recent research for DECC undertaken by Databuild, shortly due to be published alongside the Community Energy Strategy (late January 2014).

most useful, and subsequently developing support activities to facilitate growth of existing partnerships and building new ones.

- Working with the south west community energy sector to assist them in the development of activities to target and refer households to available schemes.
- Encouraging the supply chain to work increasingly with local and national groups and campaigns to raise awareness in the market. In particular supporting national, local Government and third sector supported campaigns would help, as these messages are more trusted.
- Social housing – there would be value in demonstration of existing, successful social housing projects to improve awareness amongst social housing providers.

Long term

- Private rented sector –there is value in targeting tenants who rent from a private landlord to increase awareness of current opportunities for retrofit (e.g. landlord's energy saving allowance) and proposed regulations to ban renting of F&G EPC rated properties from 2018. Awareness would be the first step towards uptake of measures in this sector of the market.

2. Generating interest

- There is a larger proportion of off-gas properties in the south west than in other regions, which provides a more compelling case for retrofit action. There are approximately 400,000 off-gas properties in the south west, which accounts for 17% of the total number of households.
- There is evidence[131] that social housing providers are not taking as much retrofit action as they could be, in particular to take full advantage of the opportunities provided by policies such as ECO, RHI and FIT.
- Private rented sector - As with other parts of the UK, the south west private rented sector remains largely untapped with respect to retrofit.

Actions which would help take advantage of these opportunities include:

Short-medium term

- Influencing Government to improve support and incentives for retrofit, in particular assistance to:
  i. *Improve householder uptake of Green Deal*
  ii. *Fill gaps in market support, delivered previously under CERT, but which now fall between ECO and Green Deal support.*
- Ensuring the focus of existing targeting campaigns is on 'off-gas' parts of the region, where possible, demonstrating the business case provided by retrofit measures and technologies. In particular including incentives, which directly provide further support for them (e.g. RHI).
- Social housing – providing further advice to social housing providers to help them take full advantage of policy support, including how best to work with ECO providers and suppliers to obtain maximum value and take more of a 'whole house' approach. .
- Building the capacity and skills of the community energy sector to grow their role in actively delivering retrofit activity.
- Increasing market and technology confidence by improving advice and information support for householders, including
  i. *Impartial advice and information (e.g. Government backed)*[132]
  ii. *Tools and information to highlight which measures would be appropriate for individual homes/circumstances etc.*

[131] From the interviews with social landlords, ECO providers and supply chain

[132] There is a known gap in the market for information and advice, since the removal of funding for Energy Saving Trust advice centres in 2012.

iii. Exemplar homes – to showcase measures/technologies in practice.

Long term

- Private rented sector – furthering work with landlords, in particular those with large portfolios[133] to develop retrofit schemes, taking advantage of the landlord energy saving allowance and future-proofing their stock for proposed 2018 legislation.

12.3 Barriers to supply

There are a number of key supply chain barriers evident in the market. As discussed above, supply issues are perceived to be less of an issue in the current market due to demand constraints. However, supply chain barriers would become significantly more of an issue should demand increase significantly to meet required levels of activity to meet 2020 carbon emissions targets[134]. Market-wide supply chain barriers are focused around two key issues:

1. Skills and capacity for delivering retrofit activity.
2. The effectiveness of retrofit delivery.

1. **Skills and capacity:** The market as a whole is not set up to deliver retrofit on the scale required to meet 2020 carbon emissions targets. Furthermore at current levels of activity there are existing supply chain constraints. Key aspects of this include:

- The intensive energy efficiency sub-sector – where there is a lack of specialist skills in the market to deliver current ECO work[135], such as solid wall insulation. This study found there to be only 59 businesses in the south west that are accredited to deliver solid wall insulation.
- The renewable heat sub-sector – in particular for large, multiple property installation activities.[136] Whilst this study found there to be over 500 businesses in the south west delivering renewable heat work, many are small businesses and conduct work on a single property at a time.
- Supply chain respondents across all four sub-sectors reporting that it is less commercially attractive to work in retrofit than other areas, such as new build
- Certifications and accreditations such as PAS 2030, MCS, HETAS are a barrier to policy supported retrofit activity (e.g. RHI, FIT), particularly for small organisations, such as sole traders. Out of the estimated 6500 businesses currently operating in the retrofit market, approximately a third are currently accredited, which suggests the potential scope of other businesses to become accredited.

Opportunities for growth in the south west include:

- The south west market has a well-developed supply chain for microrenewable heat and microrenewable electricity technologies compared to other regions. Therefore continuing to build on this will ensure retrofit activity in the south west is delivered by the local market, and increasingly will supply to other parts of the UK.
- There is confusion (including some disillusion[137)] in the market, due to lack of understanding of, and confidence in policy support for retrofit, such as ECO and Green Deal. Therefore there is an

[133] Where there is opportunity for larger scale action. Large portfolio landlords also take a more active approach to managing their stock, with regular maintenance programmes, which can provide an opportunity for retrofit activity.
[134] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/65602/6927-energy-efficiency-strategy--the-energy-efficiency.pdf.
[135] This is dependent on whether there are future changes to ECO
[136] For example within the social housing market
[137] Such as due to changes to policies e.g. FIT support levels in 2012.

opportunity for increased investment and activity by improving understanding and confidence in the policy landscape.

Actions which would help take advantage of these opportunities include:

Short-medium term

- Continuing to provide, and increasing advisory and financial support (e.g. Ready for Retrofit support, including business assist and vouchers). This should particularly focus on smaller businesses[138], where existing support has potential for greater impact.
- Communications activities with the supply chain (e.g. through supply chain networks) to improve understanding of the opportunities provided by retrofit, policy support and potential provided by obtaining specific skills (and accreditations) to undertake work. Ensuring impartiality and independence of information is important to increase trust.
- Undertaking showcase activities to showcase supply chain excellence demonstrated in the south west, such as microrenewables. This will enhance the south west's reputation for delivery and assist increasing activity in other regions.

2. **Effectiveness of retrofit delivery** – Across the market, there is evidence of a lack of an overall joined up approach to delivering retrofit activity, with current delivery characterised by:

- Sub-contracting multiple specialist and generalist organisations to deliver retrofit measures within projects
- Small organisations with specialist skills to conduct retrofit work within a narrow scope (e.g. specialising on single or few retrofit measures). Within this, there is reported constraint in terms of the range of solutions provided by specialists, narrowing the applicability to some property or project types[139].
- A lack of south west based project contract managers, with capacity to manage large retrofit projects.
- Lack of evidence of co-ordinated targeting work to fully understand the scale and nature of retrofit opportunities, where they lie and developing business cases for action.

The above issues have a magnified effect when delivering work which requires multiple retrofit measures to be delivered within one project (whole house retrofit) as cited in previous research[140]. There is also evidence from the interviews with social landlords and the supply chain that current retrofit activity is not being delivered on this basis, which is constraining the effectiveness of retrofit delivery.

Opportunities for growth in the south west include:

- Increasing the extent to which larger retrofit contracts are managed by businesses in the south west. This will increase the value of work within the south west, and also increase the control of activities delivered under those contracts (e.g. sub-contracted installation) being delivered by south west businesses.
- Building on areas of the south west retrofit market which are well developed (e.g. microrenewable sub-sectors) to increase the range of retrofit services provided to enhance capacity and skills to deliver whole house retrofit, both through in-house services and well developed relationships with other retrofit specialists and generalists providing support work.

[138] Businesses also cited that accreditation support was more beneficial to smaller businesses as slightly larger ones were better equipped and resourced to go through the accreditation process.
[139] As a result of specialists only being trained in a narrow range of solutions.
[140] http://www.instituteforsustainability.co.uk/uploads/File/KeyFindingReports_Retrofit.pdf

- Local and national data sources, which exist to improve the potential to identify and target retrofit activities[141].

Actions which would help take advantage of these opportunities include:

Short-medium term

- *Assist, through advice and training, south west based building contract managers – to help them gain more access to managing retrofit projects, in particular larger contracts which are being won by contractors based outside of the region.*
- *Develop potential for existing south west based organisations to form consortia to tender for large-scale (e.g. social housing) projects.*
- *Developing networking activities to facilitate relationship building between retrofit specialists delivering different measures, and supporting generalist organisations.*
- *Working with ECO providers, Local Authorities and others leading retrofit delivery work to facilitate targeting, such as through the use of data targeting tools.*

Long term

- *Facilitating the development and training of retrofit specialists to be trained in a wider range of solutions, and to generate in-depth expertise in retrofit measures, where there is currently less expertise (e.g. intensive energy efficiency measures). This includes working with south west based colleges to develop specialist courses and qualifications.*

13 Opportunities for further research

This report provides a useful understanding of the current state of the retrofit supply chain and market in the south west overall. However, there are a number of key areas, where further research would be beneficial to increase the depth of understanding of the market, in particular at a sub-sector and supply chain stage level, where the resources and scope of this project was able to only provide initial insights. Key areas of suggested future research include:

- *Further, targeted research into specific sub-sectors to fully understand the scale of activity being undertaken and provide depth of understanding of the opportunities and barriers to growth.*
-
- *Targeted research into specific opportunities and barriers to deepen understanding about what forms of support and activity would most effectively support growth*
-
- *Undertaking research with householders to better understand the drivers and barriers to retrofit in the south west, in particular for specific groups, such as*
- *Households in off-gas grid areas, to understand the scope of the potential for accelerating demand through this market*
- *Vulnerable householders, who are hard to engage, but have significantly more assistance available to them to facilitate retrofit activity*
-
- *Further research to understand the opportunities and barriers in the private rented sector, where there is untapped potential for cost effective retrofit.*

[141] For example, Local Authority and social housing stock surveys, Energy Saving Trust home analytics and other tools.

14 Appendix 1: Methodology for weighting

Stage 2 involved establishing the population of businesses that could be involved in retrofit, and then a quantitative telephone survey of those businesses, as outlined below.

Building a population database

Five trade associations were contacted to capture date relating to the size of the population of businesses actively involved in retrofit, from their membership data. The interviews with trade associations revealed that they either did not capture data relating to retrofit activity, or they were not able / willing to share it.

Five commercial database providers were contacted as a way of establishing the number of businesses in the South West region operating at each stage of the retrofit supply chain and in each of the measures included in the scope of this research.

As retrofit activity does not have its own SIC[142] code, examples of companies from the Regen SW Directory, illustrative of the type of business involved in retrofit activity, were sent to the commercial database providers. The database providers matched their records to identify which SIC codes those businesses are classified under.

We found that Experian were able to match the greatest proportion of businesses to their database, using the Thomson classification. Using the classification they were able to provide counts for the number of businesses that could be involved in retrofit activity within the South West region.

Market survey

To ensure the survey provided good coverage of all businesses in the South West the sample was compiled from two sources:

1. A sample of businesses from the population identified through the commercial database provider, Experian.
2. To ensure adequate sample across all stages of the supply chain and all technologies, a selection of businesses from Regen South West's Directory were included within the sample.

The survey comprised:

- 100 quantitative telephone interviews with businesses active in the retrofit market
- 95 quantitative telephone interviews with businesses that are inactive in the retrofit market

To ensure that interviews were conducted with businesses across the supply chain and across a wide range of retrofit measures, minimum numbers of interviews across each group were set.

Weighting

Interview responses are weighted to allow us to:

- Gross up the interview responses to the whole population
- Account for any under or over-representation of particular types of business in the interviewed sample compared to the business population

[142] Standard Industrial Classification

To calculate the weighting factors to be applied, a number of steps were taken during and after data collection. Data from all contacted businesses (including businesses who were not interviewed) were analysed to establish the proportion in each sector who were:

- Not in target sector (i.e. not a business, no longer in business, not in a relevant sector etc.)
- Active in the retrofit market
- Inactive in the retrofit market

During data collection, researchers were encouraged to check whether the business was active in the retrofit market at the outset of the conversation to ensure we could more accurately assess these proportions.

These proportions were applied to the population figures in each sector supplied by Experian to calculate the likely number of active and inactive businesses in each sector in the population. Each interviewed respondent was then given a weight equal to:

$$\frac{Population\ size\ of\ strata\ X}{Number\ of\ interviewed\ respondents\ in\ strata\ X}$$

The weighting factors applied to different businesses can be found in the table below:

Sector (by Thomson Classification code)	Weighting for businesses active in retrofit market	Weighting for businesses not active in retrofit market
Air Conditioning & Refrigeration Contractors	N/A - none active found in population	25.5
Architects	39.3	36.4
Architectural Services	24.2	218.0
Boilers - Servicing, Replacements & Repairs	62.7	N/A - none inactive found in population
Builders	441.6	66.2
Builders' Merchants	29.5	205.0
Building Consultants	91.8	51.0
Building Refurbishment & Restoration Contractors	69.0	68.8
Building Services	34.0	17.0
Carpenters & Joiners	N/A - none active interviewed	366.0
Central Heating - Installation & Servicing	90.8	83.0
Central Heating Supplies & Equipment	17.0	N/A - none inactive found in population
Civil Engineers	N/A - none active found in population	57.0
Conservatories	31.8	N/A - none inactive found in population
Damp Course Manufacturers	13.0	N/A - none inactive interviewed
Design Consultants	N/A - none active found in population	11.6
Domestic Appliances - Servicing & Repairs	8.0	N/A - none inactive interviewed
Door & Window Furniture	11.0	7.0
Double Glazing Installers	77.1	N/A - none inactive found in population

Electrical Engineers	N/A - none active found in population	39.5
Electrical Goods - Servicing & Repairs	N/A - none active found in population	65.0
Electrical Testing & Inspecting	19.0	25.3
Electricians	78.4	130.6
Electronic Engineers	10.0	21.0
Energy Assessors-Domestic	1.0	N/A - none inactive found in population
Energy Conservation Consultants & Equipment	11.0	14.0
Energy Management Control Systems	10.0	4.0
Engineers - Consulting	110.0	36.7
Gas Engineers	36.7	27.5
Gas Installers	48.7	N/A - none inactive interviewed
Heating Contractors & Consultants	48.7	N/A - none inactive found in population
Hire Centres	15.5	23.3
Insulation Installers	4.4	N/A - none inactive found in population
Joinery Manufacturers	566.0	100.0
Loft Conversions	25.0	5.0
Logs, Firewood & Peat Fuel	5.0	8.5
Painters & Decorators	188.0	375.3
Plumbers	130.7	37.6
Plumbers' Merchants	25.3	N/A - none inactive found in population
Renewable Energy	2.5	10.0
Roofing Services	721.0	103.0
Roofing Supplies & Materials	N/A - none active interviewed	6.0
Solar Energy Equipment	13.5	N/A - none inactive found in population
Solar Panel Installers	2.3	N/A - none inactive found in population
Surveyors & Valuers	35.0	58.0
Surveyors - Building	138.0	46.0
Glaziers	50.0	50.0
Property Maintenance & Repairs	17.5	81.3

The estimated population size of businesses (active and inactive in the retrofit market) for each Thomson classification code can be found in the table below:

Sub-group (by Thomson classification code)	Estimated active population size	Estimated inactive population size
Air Conditioning & Refrigeration Contractors	0	102
Architects	236	255
Architectural Services	145	218
Boilers - Servicing, Replacements & Repairs	188	0
Builders	2208	331
Builders' Merchants	59	205
Building Consultants	367	102
Building Refurbishment & Restoration Contractors	138	275
Building Services	68	34
Carpenters & Joiners	73	366
Central Heating - Installation & Servicing	454	83
Central Heating Supplies & Equipment	17	0
Civil Engineers	0	114
Conservatories	127	0
Damp Course Manufacturers	13	22
Design Consultants	0	58
Domestic Appliances - Servicing & Repairs	8	58
Door & Window Furniture	11	7
Double Glazing Installers	540	0
Electrical Engineers	0	79
Electrical Goods - Servicing & Repairs	0	65
Electrical Testing & Inspecting	38	76
Electricians	784	1175
Electronic Engineers	10	21
Energy Assessors-Domestic	4	0
Energy Conservation Consultants & Equipment	22	56
Energy Management Control Systems	30	4
Engineers - Consulting	110	110
Gas Engineers	110	55
Gas Installers	146	9
Heating Contractors & Consultants	146	0
Hire Centres	31	93
Insulation Installers	44	0
Joinery Manufacturers	566	100
Loft Conversions	75	5
Logs, Firewood & Peat Fuel	10	51

Painters & Decorators	188	1126
Plumbers	1438	188
Plumbers' Merchants	76	0
Renewable Energy	37	10
Roofing Services	721	103
Roofing Supplies & Materials	22	6
Solar Energy Equipment	54	0
Solar Panel Installers	21	0
Surveyors & Valuers	35	174
Surveyors - Building	138	46
Glaziers	50	50
Property Maintenance & Repairs	105	244

Exceptions to above grossing up method

A slightly different approach was used to estimate the turnover generated by retrofit specialist businesses in the renewable electricity and renewable heat sub-sectors. A low proportion of respondents in these two sub-sectors were able to provide turnover figures, which therefore resulted in an inaccurate estimate of the turnover generated by these groups of businesses. Instead, we used data from the Regen SW directory which had good turnover coverage for businesses in these two sub-sectors. Calculations were based on the following:

1. Calculating average turnover per business (the 5% trimmed mean to remove outliers which may distort the result) of each renewable electricity and renewable heat businesses
2. Multiplying the average turnover per business by the estimated number of businesses in each of those sectors to provide a total turnover figure
3. Calculating the mean proportion of retrofit related turnover across each group of businesses and applying that to the total turnover figure.

Weighting for each sub-group is outlined above. However, for solar panel installers, the population counts from Experian appeared to be inaccurate when compared to data on the MCS register. Therefore the results for solar panel installers were weighted to the approximate population (500) of businesses accredited to install solar PV through MCS.

Five cases with extreme weights, exceeding 500, were removed from the analysis that calculated the estimated number of businesses and estimated turnover generated, to avoid potential distortions. These cases included businesses classified under Thomson as builders, joiners and roofers, where we only interviewed a very small proportion of the population, resulting in an excessive weighting calculation.

15 Appendix 2: Literature review

15.1 Approach

The purpose of this literature review was to identify what information was already available to address the following five research objectives:

1. The scale (number of businesses, number of employees and turnover) of the retrofit market in the South West[143]
2. How each of the types of organisations along the value chain interact with each other to deliver retrofit projects[144]
3. The opportunities for growth in the SW retrofit market
4. The barriers to organisations realising opportunities in the retrofit market
5. What could be done to remove barriers to enable more retrofit work to take place?

As well as providing useful background information, it aim of the review was to identify knowledge gaps for the primary research to prioritise and address.

The literature review followed the approach of a rapid evidence assessment. This type of review provides an overview of existing research on a specified topic and collation of the evidence provided by those studies which is limited to answer the points of particular interest, rather than summarising the literature more generally. The review was therefore rigorous and systematic but limited to the research objectives above.

Documents were reviewed and key information was fed into an overall Excel spreadsheet. Key themes and quotes were then drawn from the spreadsheet to produce this literature review.
The literature review identified:

- Useful sources of information regarding the size of the SW retrofit market in terms of employees (Full Time Equivalent employees), GVA and the amount of Green Deal activity in the region
- Some information about how the supply chain works
- Opportunities for growth in the national retrofit market (and in the SW as part of the UK market)
- Barriers and challenges facing the UK retrofit market and solutions to overcome them
- Knowledge gaps that could be addressed by focused primary research

The literature review identified the following knowledge gaps:

- Although some data was identified, there is a lack of up-to-date information regarding the size of the current UK retrofit market
- There is very little data detailing how different parts of the supply chain work together in the retrofit market
- The retrofit market is difficult to define because retrofit work that is carried out by contractors may not be identified as such. For example, an installer who replaces a broken single glazed bedroom window with a double glazed one is effectively doing retrofit work, although it may not be categorized in this way.

[143] Although the Ready for Retrofit programme does not extend to Cornwall, the scope of this study included Cornwall.
[144] A 'value-chain' represents the various processes involved in producing goods (and services), starting with raw materials and ending with the delivered product.

15.2 Scope

The documents reviewed were:

- Arup (for the Green Construction Board), *Low Carbon Routemap for the UK Built Environment* (2013) http://www.greenconstructionboard.org/otherdocs/Routemap%20final%20report%2005032013.pdf

- Arup (for SWRDA), *Low carbon rural economy* (2010) http://economy.swo.org.uk/EasySiteWeb/GatewayLink.aspx?alId=43297

- Arup, *What are the opportunities and implications on the rural South West of developing a low carbon economy?* (May 2010)

- Arup, Delivering and Funding Housing Retrofit: A review of Community Models (2013)

- Carbon Trust, *Technology Innovation Needs Assessment Domestic buildings* (2012) http://www.carbontrust.com/media/218010/tina-domestic-buildings-energy-efficiency-summary-report.pdf

- Consumer Focus, *Keeping FIT Consumers' attitudes and experiences of microgeneration Autumn* (2011) http://www.consumerfocus.org.uk/files/2012/04/Keeping-FiT.pdf

- Department for Business, Innovation and Skills, *Low Carbon Environmental Goods & Services (LCEGS) Reports* (2010/11) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/224068/bis-13-p143-low-carbon-and-environmental-goods-and-services-report-2011-12.pdf

- Department of Energy and Climate Change, *Domestic Green Deal and Energy Company Obligation in Great Britain, Quarterly report,* (2013)

- Department of Energy and Climate Change, *Energy Efficiency Strategy* (2012) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/65602/6927-energy-efficiency-strategy--the-energy-efficiency.pdf
- Department of Energy and Climate Change, *Great Britain's housing energy fact file* (2012) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/201167/uk_housing_fact_file_2012.pdf

- Department of Energy and Climate Change, *National Energy Efficiency Data-Framework – Report on the development of the data framework and initial analysis* (2011) http://www.cewales.org.uk/cew/wp-content/uploads/National-Energy-Efficiency-Data-Framework.pdf

- Department of Energy and Climate Change, *National Energy Efficiency Data-Framework Summary of Analysis using the National Energy Efficiency Data-Framework Part I Domestic Energy Consumption* (2013) https://www.gov.uk/government/publications/national-energy-efficiency-data-framework-need-report-summary-of-analysis-2013-part-1

- DTZ (for Regen SW), *The Economic Contribution of the Renewable Energy and Energy Efficiency Sectors in the South West of England* (2008; updated 2009) http://regensw.s3.amazonaws.com/1282046376_675.pdf

- EST & Regen SW, *SW Competitiveness Programme - Supporting the Domestic Energy Efficiency and Micro-Generation Sectors: Full Proposal and Business Plan* (2012)

- Element Energy Ltd. & Quantum Strategy and technology Ltd. (for EEPH), *An assessment of the size of the UK household energy efficiency market* (2008)

- Energy Saving Trust, *Housing Model: Assumptions Document* (2010)

- Institute for Sustainability, *Building opportunities for business- introduction to the low carbon domestic retrofit guides* (2011) http://bob.instituteforsustainability.org.uk/knowledgebank/retrofitguides/guide-1/Pages/Download.aspx

- Institute for Sustainability, *Key Findings: Analysis of a selection of Retrofit for the Future projects* (2013) http://www.instituteforsustainability.co.uk/uploads/File/KeyFindingReports_Retrofit.pdf

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- Regen SW, *Business opportunities for the energy efficiency sector in the South West of England* (2009) http://regensw.s3.amazonaws.com/1271676328_522.pdf

- Regen SW, *Guide to energy efficiency products and services in the South West of England* http://regensw.s3.amazonaws.com/energy_efficiency_directory_2nd_edition_40609b239f6ec1dc.pdf

- The Construction Index, 'Insulation industry warns of 16,000 job losses' (11th October 2012) http://www.theconstructionindex.co.uk/news/view/insulation-industry-warns-of-16000-job-losses

- The University of Sheffield Logistics and Supply Chain Management (LSCM) Research Centre, *Regional Supply Chain for Energy Efficiency Measures to Retrofit to Existing Housing: Scoping Study for the Yorkshire and Humberside Region - Final Report* http://www.shef.ac.uk/polopoly_fs/1.119440!/file/FinalRep.pdf

- Vern Pitt, 'Cavity wall insulations collapse under Green Deal' (28th May, 2013) http://www.building.co.uk/sustainability/sustainability-news/cavity-wall-installations-collapse-under-green-deal/5055444.article

15.3 Scale of the SW retrofit market

Establishing the size of the retrofit market in the South West was problematic for several reasons, including:

- There is a dearth of focused research
- Research studies that have been conducted often contain contradictory information / data
- There is often no way of telling whether businesses involved in activities associated with retrofit are actually actively doing retrofit e.g. an architect listed as having energy and environmental expertise may not be involved in retrofit at all
- There is an absence of data regarding what proportion of a business' work is retrofit and what is new build
- Trade associations were not found to be useful sources of data; where they do have information this only provides a rough indication of population size and does not represent the entire market. This was also true of accreditation / certification schemes. Although these represent a significant proportion of the population, there are suppliers / installers without accreditation doing retrofit in the South West

15.3.1 Businesses

A report by the Department for Business, Innovation and Skills into the Low Carbon Environmental Goods & Services sector (LCEGS) put the number of South West regional LCEGS companies at 4,237, and LCEGS employment at 77,688 in 2011/12. The SW was the fifth highest out of nine regions in both cases. The report also established SW LCEGS building technologies sales to be £1,24billion in the same year.

An Arup report reviewing the opportunities and implications on the rural SW of developing a low carbon economy cited Innovas figures that put the LCEGS sector as being worth £8.7 billion in the SW in 2010.[145] Innovas also established there were 4,200 companies within the LCEGS sector (verifying the BIS report) and 7,400 FTEs. The report asserts that microgeneration is a large sub-sector of the LCEGS sector in the SW, accounting for 12% of employees (888) and 16% of firms (672). Wind is reported to be the largest subsector, with 32% of employees (2368) and 23% of firms (966) – however, there is no way of establishing what proportion of this is attributable to domestic retrofit.

According to the DTZ report for Regen SW, it was estimated that the renewable energy sector directly employed almost 5,200 FTEs in the South West in 2010 (this figure was estimated to be 2945 in 2008). The report estimated that a further 4,600 FTEs were employed in the energy efficiency sector (with 4,320 in 2008). Regen SW identified 731 businesses active in the renewable energy (RE) and energy efficiency (EE) sectors in the South West with a combined GVA of over £400 million.

[145] Innovas, *Low Carbon and Environmental Goods and Services: an industry analysis*, BERR, March 2009

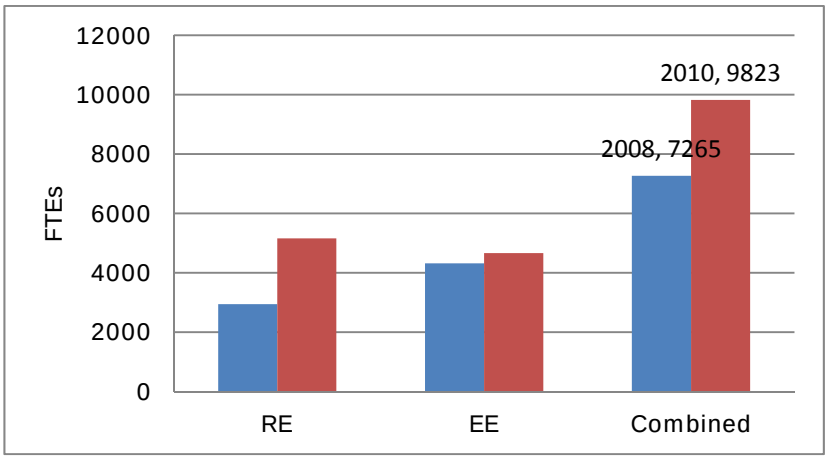


Figure 1: Direct FTEs Contribution of RE and EE sectors in the SW

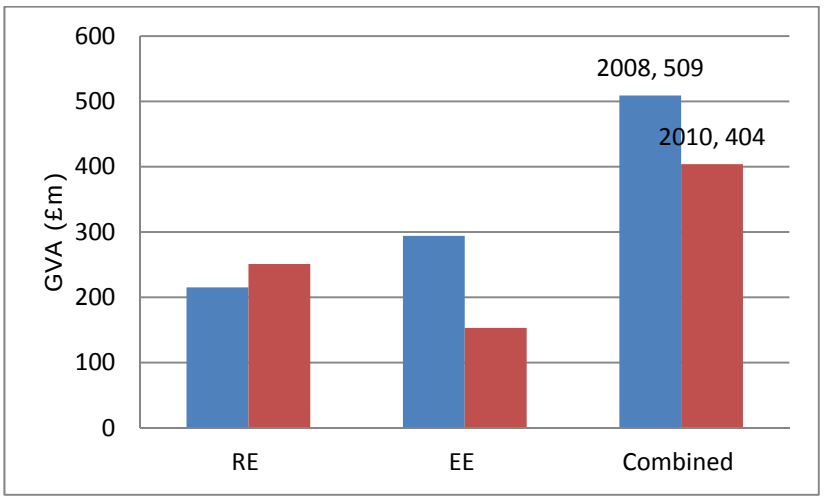


Figure 2: Direct GVA Contribution of RE and EE sectors in the SW

Although this provides useful scoping information regarding the size of the combined RE / EE markets in the South West, it does not give any indication as to the proportion of FTEs that are active in the domestic retrofit market. For the purpose of this study the only RE activity that is relevant is microgeneration, and the only EE activity that is relevant is domestic activity.

A 2010 scoping study done to assess the regional supply chain for EE retrofit in the Yorkshire and Humber region identified the South West as a good comparison because of the similar size of the market (and population). This particular study estimates the amount of FTEs involved in EE domestic retrofit to be around 5,000 in the South West. If this is correct, then approximately half of the total South West RE / EE market, established by the Regen SW report, is involved in retrofit activity.

The scoping study also identified that the median employment for firms active in the South West energy efficiency sector is 25 people, with firms employing 1 – 9 people only representing 30% of the total. In addition, 64% of South West firms are based on only-site structures (in comparison to 75% in Yorkshire).

15.3.2 Green Deal

Another way of trying to assess the scale of the retrofit market in the South West is to see how many companies are operating as part of the funding mechanisms aimed at financing retrofit. The Green Deal Oversight and Registration Body (ORB) maintains a register of all authorised Green Deal assessors / providers / installers on behalf of the Government for administrative, reporting and quality checking purposes. The ORB participation register currently lists 47 Green Deal assessors, 17 Green Deal providers and 167 Green Deal inspectors who offer domestic services within the South West.[146]

Launched in January 2013 to replace the Carbon Emissions Reduction Target (CERT) and the Community Energy Saving Programme (CESP) funding, the Green Deal has been in operation for nearly nine months, at the time the literature review was conducted. A report detailing Green Deal statistics covering assessments, cash back and ECO for the period between January and June 2013 was published in September by the Department of Energy and Climate Change (DECC). The report identified the following for the South West:

- 4,038 Green Deal assessments have been lodged, amounting to 9% of the total amount of assessments in the UK; out of nine regions, only three have had fewer assessments lodged than the South West (North East, East Midlands and East)
- 311 cash back vouchers paid, amounting to 9% of the UK total; out of nine regions, four have had fewer paid (North East, East Midlands, East and London)
- 10,073 provisional measures delivered by ECO obligation (5,424 by CSO, 2,378 by CSCO, 2,271 by HHCRO – see figure 1), amounting to 7% of the UK total[147] (only three regions had fewer measures)

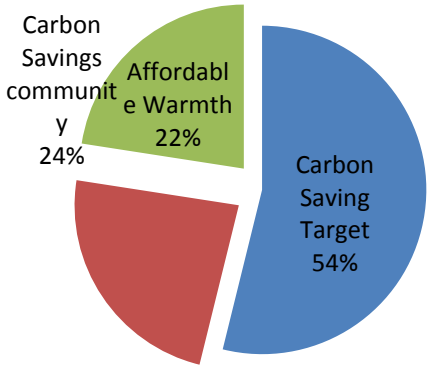


Figure 3: Split of total number of ECO measures delivered by obligation

[146] http://gdorb.decc.gov.uk/green-deal-participant-register - figures current as of 23/09/2013.
[147] This is only calculated for those ECO measures where the location is known (sixth highest out of nine regions)

15.3.3 Trade Associations

As part of an initial scoping exercise, 18 trade associations were contacted to gain further insight into the size of the retrofit market in the South West. Most associations were limited by a lack of data collection capacity to collect information and did not have regional data readily available. Furthermore, there was very little information regarding the proportion of their members' work that fell under retrofit. The small amount of information that was gathered is listed below:

- Set up by the Renewable Energy Association, the Renewable Energy Consumer Code (RECC) aims to guarantee a high level of service for consumers buying / leasing small-scale microgeneration technologies for domestic use. There are currently 4,404 RECC members in the UK, with 1,712 members situated in the South West. Although this number is not split further between retrofit and new build, it shows that there are a vast number of organisations working with microgeneration technologies in the South West.
- Data published in the Regen SW & EST SW Competitiveness programme business proposal report states there are currently 289 companies who are MCS certified. However, according to the MCS scheme there are 3,723 MCS organisations countrywide, so SW seems disproportionately low (less than 10% of the UK's microgeneration businesses). This may be because the data published in the proposal was current in 2012, and more organisations have been accredited in the SW since then.
- There are currently 723 UK members of the glass and glazing federation – 107 of these members are situated in the SW, with 86 doing double glazing (retrofit)

15.4 Value chain interaction

In 2011, the Institute for Sustainability produced a report detailing the opportunities to build business within the low carbon retrofit market. The report identifies four main roles in the retrofit process:

- Leaders - financial institutions (making capital funds available for schemes e.g. for the repayments in the PAYS scheme)
- Advisors – survey and assess homes, evaluate renewable / energy efficiency options, advise on a course of action
- Providers – receive the funding from the financial institutions, manage the instalment of the measures suggested by the advisors, and arrange funding (e.g. arrange Pay as You Save (PAYS) funding via fuel suppliers)
- Installers – accredited to install retrofit technologies and measures

  With the introduction of the Green Deal in 2013, this overview of the supply chain remains an accurate indication of how the system works. However, with the Green Deal, the capital funds are made available for the upfront costs of implementing the measures which are then paid back by the homeowner through savings made on energy bills.

15.4.1 Initial Stakeholder Qualitative Interviews

There is limited discussion in the literature reviewed regarding how the different stages of the supply chain interact with one another, but there was some interesting insight provided within the initial qualitative interviews with key stakeholders within the retrofit market. The findings are detailed under the following sub-headings.

Trade Association

The first respondent, from the Federation of Master Builders, specified that from his experience there was very little in the way of architect involvement in the retrofit process, although there may be a technical drawing to work from. The respondent also stated that builders tend to manage the project in

conjunction with the homeowner, subcontracting out the non-fabric elements of the projects to local trade connections. This is verified by the 2012 Carbon Trust TINA report that recognises that the onus is often placed on the homeowner to manage the various elements of domestic retrofit, as a consequence of the fragmented supply chain.

With regard to suppliers, the respondent specified that builders are likely to use two or three local suppliers and if the requisite materials are not stocked by these thena particular building service is not generally offered. For retrofit work this is clearly a limitation, if the local manufacturing and supplying does not provide an adequate array of products to complete whole-house retrofit then the ability of local tradespeople to provide such a service is hampered. This view is significantly reflected in the literature reviewed, with an underdeveloped supply chain cited as the main inhibitor to growth in the retrofit market.

Manufacturer

The next respondent, a manufacturer of external wall insulation (EWI) in the SW, said they typically networked with architects (who promote their product in their specification) and also SME installers / contractors who intend to use the product (some at national level). The manufacturer has a training facility, offering free training on system installation, and they also have a list of recommended installers. Of the typical installers they work with, 60-70% of their work will be as a sub-contractor to a larger main contractor.

The manufacturer also works with Registered Social Landlords (RSLs), offering a social inclusion package to benefit local communities (such as offering young / vulnerable people work when the RSL choose their product). They also work with structural engineers.

Installer

The next respondent's company traditionally installs EWI but has recently expanded to include microgeneration technologies, such as solar PV / thermal, biomass and heat pumps. The company's retrofit work mainly comes from providers or third party organisations that sit between utility companies and contractors. The company specialises in installation but also has an in-house designer, so they rarely use external expertise in this area. They also have branches out to include aftercare / maintenance in the services they provide. By keeping the design, installation and maintenance in-house, the respondent does not feel reliant on the local supply chain – they specify that they have a lot of competition and there are many manufacturers to choose from.

With regard to working with manufacturers, the respondent's company do not have one fixed manufacturer in place that they buy from in every case. Often they go straight to a specific manufacturer for specific products e.g. Mitsubishi, Infinity PV. However, the respondent has a relationship with a wide range of manufacturers, with no obligation to use a particular product. Instead, the respondent offers low, medium and high cost solutions, fitting whatever the customer prefers.

The respondent identified that a lot of installers will only work with one of two manufacturers of each product type but was unsure of the benefits to this approach. This approach is similar to the barrier identified by the respondent from the FMB – if one of two manufacturers (or suppliers as specified by the FMB) the installer has an exclusive relationship with do not produce / source a particular product needed for whole house retrofit, then the installers ability to provide this measure is significantly reduced.

Broker

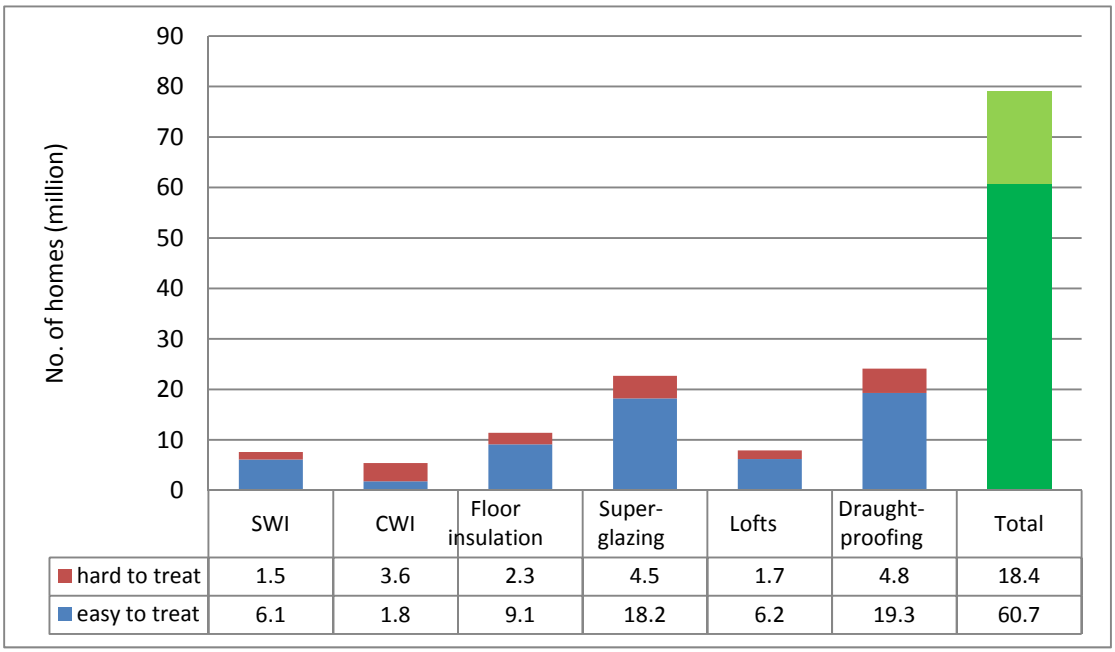
The fourth respondent sits between energy utility companies and installers, brokering deals on ECO funding. For most of the installers the respondent works with, they go directly to a manufacturer (such as Knauf) instead of a merchant / supplier.

The respondent explained that a lack of multi-skilled contractors may prove to be a barrier to whole house retrofit. According to the respondent, installers generally don't have a full understanding of more than one measure. However, ECO states that all measures on a single property must be done by one organisation – therefore, there is a risk that a property may have SWI done by one company but because that company do not offer loft insulation, the property could miss out on that measure. It was noted that this does also present an incentive for contractors to diversify their skill set in order to win more work.

15.5 The opportunities for growth in the SW retrofit market

A report by Arup in 2010, reviewing the opportunities and implications on the rural SW of developing a low carbon economy, identifies the South West as having the worst building stock in the country in terms of energy efficiency. This comes as a result of so many homes being off-grid. The Arup report notes that this makes this building stock perfectly suited to the implementation of microgeneration and EE technologies.

The Low Carbon Routemap produced by Arup for the Green Construction board in 2013 puts forward a number of scenarios relating to the potential scope of the retrofit market in the UK. One of these scenarios is the 80% reduction scenario (which meets the 2050 carbon reduction target). If this is to be achieved, around 95% of easy-to-treat homes, and 70% of hard-to-treat homes, across the UK will be retrofitted with insulation, draught proofing and super glazing by 2050. The report estimates that under the 80% reduction scenario, by 2030 annual spending on domestic retrofit activity could reach £4.5 billion. The maximum penetration of domestic retrofit measures (as per 2050 pathways calculator) is as follows:



	SWI	CWI	Floor insulation	Super-glazing	Lofts	Draught-proofing	Total
hard to treat	1.5	3.6	2.3	4.5	1.7	4.8	18.4
easy to treat	6.1	1.8	9.1	18.2	6.2	19.3	60.7

Figure 4: The maximum penetration of domestic retrofit measures, as per 2050 pathways calculator

However, the 80% reduction scenario is very ambitious and dependent on the following factors:

- An increased pace of retrofit activity across the country
- In increase in the proportion of 'hard-to-treat' properties being retrofitted
- Maximum uptake of low carbon technologies that have a positive return on investment (or are easy to implement)
- Significant uptake of low carbon technologies that do not have a positive return on investment

Despite it seeming unlikely that the 80% reduction scenario will be met, Arup's report shows the sheer scale of the market and the opportunity that exists for SMEs involved in retrofit. The report references a Verco and Cambridge Economics study that found that treating the UK's 9.1 million fuel poor homes alone could create 129,000 jobs per annum.

In their business proposal for stimulating the retrofit market in the SW, the Energy Saving Trust (in conjunction with Regen SW) refer to Government estimates regarding the economic impact (in terms of jobs and GVA created) of delivering FITs and the Green Deal. The pro rata figures for the SW are: £2.5 billion in sales, 1,812 jobs a year, 14,950 jobs and £0.9 billion GVA between 2010 and 2020.

15.5.1 Supply Chain

The 2010 Regen SW study of the economic contribution of the RE and EE sectors in the South West reports the following distribution of where SW RE/EE businesses purchase their supplies:

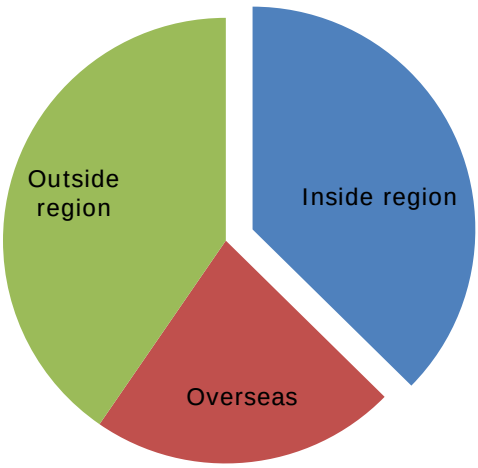


Figure 5: Distribution of where SW RE/EE businesses purchase their supplies

The report reveals that EE businesses make a larger proportion of their purchases from within the SW region (49%) than RE businesses (38%), stating that this is most likely due to the fact that the EE sector is more established in the SW. The result of a more established sector is an increased pool of suppliers to source goods and services from.

In total, just over one third of purchases made by RE / EE businesses in the SW in 2010 were made within the region (37%). This is 2% more than 2008, where 35% of businesses' purchases were made within the SW. As the report rightly identifies, this suggests that a higher proportion of businesses are sourcing from within the region.

The stimulation of the retrofit market in the South West presents a big opportunity for the development of the supply chain within the region. Despite the increasing propensity of businesses to

source RE/EE goods and services locally, nearly two-thirds of RE/EE businesses still import these from outside of the SW. Aside from the financial boost that local sourcing of goods and services provides to the local economy, a strong regional supply chain negates a lot of the problems caused by overseas importing (see barriers – section 15.6).

The 2010 Arup report into the impacts of the LCEGS sector on the rural SW states that sales to the rest of the UK have grown faster (since 2005) than sales in the region. However, only 27% of firms export – and those who do so only export on average of 8% of their output. The development of the supply chain within the region will not only stimulate the local market but also provides the opportunity to increase the propensity of businesses exporting to other regions.

15.5.2 Job Creation

A 2008 report prepared for EEPH by Element Energy Ltd. & Quantum Strategy and technology Ltd., assessing the size of the UK domestic EE market, conveys the significant opportunity for job creation as a result of a stimulated retrofit market. The report states that, led by a demand for micro-CHP systems, a growing microgeneration market will create employment for plumbers, heat engineers and electricians. Similarly, an increased uptake of renewables (e.g. solar PV/thermal, wind etc.) will need to be matched by skill development in roofing/scaffolding, and even increased demand for biomass will create additional jobs (producing wood pellets etc.).

Adapting current skills to meet the demands of a growing retrofit market presents a big opportunity for SMEs in the SW, with job losses in cavity wall insulation being picked by the expanding EWI/SWI markets. The 2008 EEPH report identifies 7 million UK homes with solid walls that are not properly insulated, with 50% of those in fuel poverty owning solid-walled homes. The report predicts 600,000 internal SWIs to be completed in the period between 2011 and 2020.

Under the Green Deal this number is widely expected to be much larger than the EEPH 2008 prediction, with added financial incentives to implement EE measures.

15.5.3 Mass retrofit

Community-led retrofit represents a great opportunity – a 2011 EST study, referenced in an OFT market study into off-grid energy, states that in a community of 50 dwellings, community scale projects could reduce capital costs by 7% for solar PV, and 34% for solar thermal (compared to individual purchases).

Economies of scale are key – contractors who engaged with the Institute for Sustainability in their analysis of a selection of Retrofit for the Future projects estimated that mass retrofit (on a company or national scale) can reduce costs by up to 25 – 30%. The report establishes technology as the prominent contributor to high costs but that there is an opportunity to drive down costs as demand encourages more companies to start manufacturing and supplying technology, increasing competition and making retrofitting cheaper in the long run.

Furthermore, the Institute for Sustainability 2013 report (detailing the key findings from their analysis of a selection of Retrofit for the Future projects) identifies the ‘whole house approach’ to mass retrofit as the most efficient way to implement EE measures. The report uses case studies to identify three different approaches to retrofit; the ‘whole house approach’, the ‘fabric-first’ approach and the Passivhaus strategy. Developing the whole house approach into a whole home energy measure plan has the potential to allow a large number of properties to be retrofitted over an extended period of

time (25-30 years), without having to relocate the occupants. The report argues that this approach allows measures to be incorporated into the home whenever they are most cost-effective. The plan, designed by architects, has the potential to be applied to a number of homes with similar properties and therefore reduces the cost of the retrofit process.

15.5.4 RHI and FIT policies

The 2008 EEPH report assessing the size of the EE market reports that the RHI has the effect of making air source heat pumps an attractive choice in certain areas from around 2010. Compared to the baseline case, the report estimates that the combination of RHI and FIT policies can potentially double the total number of microgeneration technologies sold in 2020, up to near 600,000 compared to the baseline case. As a result of these policies, the report expects the market size to be over £3bn by 2020. This is due to the FIT stimulating the market for more expensive generation technologies e.g. solar PV.

Indeed, the 2011 Consumer Focus research into consumer experiences of FIT reported a significant uptake of renewable technologies in the UK 18 months prior to the report being published (76,000 domestic installations; an estimated 25,000 new jobs; and a 30 per cent drop in costs in the supply chain).

15.5.5 Lighting

A Purple Market Research domestic lighting profile, prepared in 2011, highlights a significant opportunity for energy efficient lighting to be encouraged as part of whole-house retrofit. Statistics from 2007 estimated that there were 500 million lighting fixtures in UK homes and 900 million bulbs (750 million active). By 2012 it was expected that most bulbs would be energy efficient, potentially as a result of the phase out of GLS lamps in 2011 as mentioned by in a 2008 EEPH report on the UK domestic energy efficient sector. However, Purple Market Research expects there to be a shift from energy efficient bulbs to energy efficient fixtures by 2020.

Whereas CERT funding did not cover lighting, the Green Deal does include changes to lighting fixtures and fittings as qualifying measures for funding. The 2013 Arup report for the Green Construction board, reviewing the 80% carbon reduction by 2050 target, identifies energy efficient lighting as a market that can be stimulated as part of increased retrofit activity. The report acknowledges the sizeable carbon savings that can be made through energy efficient lighting and the good opportunity it represents – the technology already exists and is ready to implement.

15.5.6 Double glazing

In 2008, according to the EPPH report, the UK windows market was declining at 1-2% per year, with the E rating glazing market almost saturated (20 million homes double glazed to that standard). The report expected the declining double-glazing market to soon become a replacement market.

The report recognised an opportunity for the glazing industry to tackle decline by promoting higher efficiency double glazed products (e.g. windows with a BFRC C rating). By promoting these products, and establishing C as the new norm, there will be a new market for super-glazing.

15.6 The barriers and solutions to organisations realising opportunities in the retrofit market

The last two research objectives (the barriers to businesses realising the opportunities in the retrofit market / solutions to the barriers) have been dealt with together in this section of the literature review report. This is due to the fact that a considerable proportion of the reports that mentioned barriers to the domestic retrofit market also contained recommendations / solutions to overcome these barriers.

The main benefits can be separated into two categories – barriers to supply chain development, and barriers to demand stimulation. If the SW retrofit market is to meet the opportunities for growth as specified above, the barriers to these two categories need to be overcome.

15.6.1 Supply chain development

Essential to the stimulation of the retrofit market is a strong local supply chain. The literature review highlighted three significant barriers to the retrofit supply chain in the UK (and the SW as a result):

- A lack of transition planning between funding schemes
- Large contractors winning bids and taking a cut of the revenue generated by the SMEs (who are subcontracted by the large contractors to do the work)
- Lack of local manufacturers / suppliers

These barriers need to be addressed by the retrofit market in order to meet the opportunities for growth.

Lack of transition planning between funding schemes

In October 2012, the Insulation Industry Forum (accounting for 70% of the UK's insulation market) wrote a letter to the Energy Secretary, Ed Davey, expressing their concern over the lack of processes in place to negotiate the transition between old funding schemes – CERT and CESP – and the Green Deal.[148] The IIF expected 45% of jobs in the insulation industry to be lost in 2013, with the majority being loft and cavity wall insulation. In the same period, the Government expected there to be an 87.5% reduction in the loft insulation market, a 57% reduction in the cavity wall insulation market and a 16% drop in the SWI market as a result of the old incentive schemes ending and the new ones coming in to place.[149]

However, according to data collected by the Cavity Insulation Guarantee Agency, there were only 1,138 cavity wall installations completed in April 2013 compared with 49,650 in April 2012 – a 97% fall in comparison to last year.[150] The first four months of 2013 saw an average of 11,000 cavity wall insulations per month, a 73% reduction in the market, far exceeding the Government's estimate of a 57% drop.

[148] http://www.theconstructionindex.co.uk/news/view/insulation-industry-warns-of-16000-job-losses
[149] Source – ibid
[150] Source - http://www.building.co.uk/cavity-wall-installations-collapse-under-green-deal/5055444.article

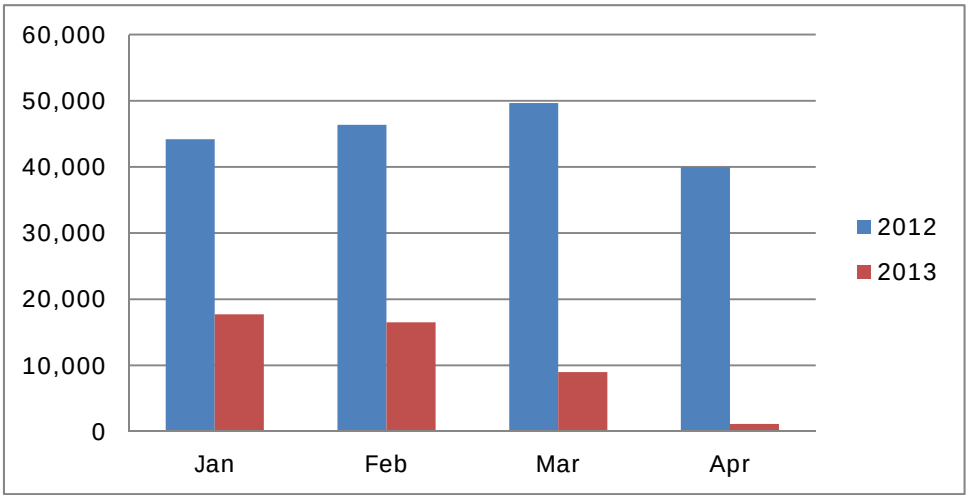


Figure 6: Cavity Wall Insulations – 2012/13 comparisons

The 2008 EPPH report expected job losses in the cavity wall insulation market to be picked up in the SWI market. In 2008, there were seven million homes with solid walls that were not properly insulated and this represents a significant opportunity for cavity wall / lost insulation installers to diversify their skills. The EEPH expected there to be 600,000 internal SWIs between 2011 and 2020. However, the IIF had concerns that the lack of transition planning would stifle investment / job creation in SWI required to deliver the low carbon targets. So far, the concerns have been justified with the Green Deal not stimulating a great deal of activity in the SWI market.

Large contractors

The Institute for Sustainability cite a current lack of multi-skilled contractors as a major barrier to mass retrofit. There is currently little opportunity to subcontract out work to one contractor because most are specialised. The Institute's 2013 report asserts that long subcontracting chains are less effective than in-house teams and should be avoided.

However, although there may be an advantage to having one subcontractor to conduct mass retrofit work – namely consistency between design and installation – this does not leave much opportunity for the region as a whole. One subcontractor retrofitting on a large scale would have a negative effect on local SMEs and businesses working on a smaller scale, leading to a lack of competition.

One SW installer, interviewed as part of the initial scoping exercise, identified the single-subcontractor model as a barrier to the development of SMEs in the region. Despite the push for using smaller businesses, Devon County Council (and others) has specified that any contractor bidding for mass retrofit work should have a turnover of £95 million. This way of operating, according to the respondent, will have a negative impact on smaller businesses. Even though the bid winner will have to subcontract to smaller, local installers after winning the work, the major contractor will essentially take a cut on the total revenue. To secure the efficiency of a single subcontractor approach recommended by the Institute of Sustainability, but also ensure a competitive local market, the supply chain can be developed.

The EST and Regen SW business plan for stimulating the domestic retrofit market in the SW asserts that the national and SW supply chains currently have a very small capacity compared with the scale of the targets. In order to meet the DECC domestic sector targets, 14,000 homes need to be retrofitted every week between 2010 and 2020. This is the equivalent of 1,100 homes per week in the South West. At the time of the business plan, less than 10 homes were being retrofitted in the SW per week.

Lack of manufacturing / suppliers

The Institute for Sustainability highlight overseas sourcing of products and materials as a significant barrier to the development of the retrofit supply chain in the UK. Although it is recognised that importing products from outside the UK can secure the right price / performance levels, it leaves retrofitting projects at risk from transport problems and fluctuating currency rates. The Institute also draws attention to the lack of availability of local connecting products to aid the integration of the imported technologies (e.g. brackets to facilitate the installation of high performance windows).

Purple market research into the microgeneration sector (2011) suggests that manufacturers require greater certainty on future market scenarios to help their planning and product development capacity. There is currently a lack of capital / access to finance to support innovation in the microgeneration sector.

By developing local manufacturing in the SW, the problems of importing technology from overseas can be negated (as well as providing a significant economic boost to the region). If manufacturers can build strong local connections with designers / installers of retrofit, and involve them in the design process, problems can be solved on a large scale (this will also help them to secure a local market for technologies).

15.6.2 Increasing demand

In addition to a strong supply chain, central to the stimulation of the retrofit market is consumer demand. The literature review highlighted the significant barriers to the demand stimulation in the UK (and the SW as a result):

- A lack of trusted information regarding the performance of microgeneration / EE measures
- Onerous accreditation
- Hidden costs (e.g. scaffolding, skirting-board removal)
- A lack of community engagement
- Inconvenience to homeowners (including potential relocation)
- Finance
- Landlord / tenant friction

These barriers need to be addressed by the retrofit market in order to meet the opportunities for growth.

Lack of trusted information

As noted in the 2013 Arup review into community models to deliver / fund housing retrofit, and the 2012 Carbon Trust Domestic Buildings TINA, the current lack of information about the energy efficiency impacts of microgeneration technologies is having a detrimental impact on the retrofit market.

The Arup report stresses that understanding the actual performance of measures and the impacts of consumer behaviour is vital to convincing homeowners and private finance that there is a strong business case for domestic energy efficiency. The Low Carbon Routemap model produced by Arup for the Green Construction Board (2013) applies the following in-use (performance gap) factors to domestic retrofit measures:

Retrofit measure	Assumed In-Use Factor (%)
SWI	30
CWI	35
Floor insulation	15
Super glazing	15
Lofts	35
Draught proofing	15

Figure 7: Green Construction Board in-use performance gaps

A report by Consumer Focus in 2011, detailing consumer attitudes towards microgeneration, states that in-home electrical displays are currently the most popular method (email is also noted as being popular) for homeowners to receive information about how much electricity a particular technology is saving them (in terms of energy and money they will save through the FIT scheme). The promotion of smart meters as a way of monitoring energy usage will provide consumers with a tangible way to understand the actual performance of energy efficiency measures. Active monitoring will also help to make the current performance gaps in technology more transparent.

This transparency is also important in order to convince homeowners and the private sector that there is a business case for energy efficiency. Once actual performance levels of measures are established and become readily available there will be added incentive to improve technology. This will increase competition in the manufacturing sector and the supply sector – with the introduction of a greater number of products to the market there will be more differentiation between the suppliers.

The 2013 Arup review into delivering / funding housing retrofit emphasises the need for further analysis of the in-use performance of EE measures (including rebound effects and performance gaps). It is recommended that this analysis is vital to the securing the success of the green Deal, and should therefore be supported by public sector bodies.

One of the initial qualitative interviewees, from the FMB, explained that builders found it difficult to communicate the benefits of EE measures to homeowners. Calculating potential cost savings and explaining these to the customer is very challenging without impartial information to refer to. Without this information, builders (in tandem with homeowners) are dependent on manufacturers, who have a vested interest, to recommend a particular product. Independent consumer guides and accreditation processes (see below) may help to build trust in the benefits of retrofit measures, making them more attractive as a result.

Accreditation

One way of increasing consumer confidence in EE measures is by accreditation schemes such as the Microgeneration Certification Scheme and the REAL Renewable Energy Consumer Code (RECC). By agreeing to a code of practice, retrofit / microgeneration companies can assure homeowners that the performance gaps / prices they quote are reliable.

In spite of this, the Office of Fair Trading and the University of Sheffield Logistics and Supply Chain Management (LSCM) Research Centre both highlighted the Microgeneration Certification Scheme as being particularly onerous for small businesses. For many SMEs, the scheme is too expensive and difficult to make it worthwhile. If SMEs cannot afford to get MCS accreditation this will have a detrimental effect on the market and reduce competitiveness in the South West (because the consumer is always more likely to use an accredited installer).

However, although MCS accreditation may be seen as onerous and expensive, it is also necessary to build consumer confidence and increase demand. Therefore, an adequate solution would be to make the MCS scheme more accessible to small businesses – this would both help encourage competition and build up consumer trust in the process. This area represents a big opportunity, especially considering the 2010 Arup report reviewing the opportunities and implications on the rural South West of developing a low carbon economy.

The complexity of microgeneration technology (and its related impacts) is also cited by the 2011 OFT off-grid energy market study as leaving consumers vulnerable to mis-selling. The exaggeration of the likely benefits (as discussed above) can be prevented by the REAL RECC. RECC members are companies selling / leasing small-scale renewable or low carbon heat / power generation units who have agreed to comply with a consumer code. The code (and associated guidelines) is designed to provide the consumer with accurate performance data without feeling pressured by fictitious marketing / sales tactics.

Hidden costs

A review of the SWI supply chain by EST in 2009 highlights the lack of clarity regarding the cost of solid wall insulation. The costs vary drastically depending on whether work is being done in conjunction with other home improvements e.g. repairing the outside of a property. The EST report states that there is a significant discrepancy between the INCA (Insulation Association) estimation of £45 per sq. m for EWI (or £4000 - £5000 for a typical semi) and the actual cost of doing the work. The report estimates the real cost of EWI to be over £100 per sq m (or £9,000 - £10,000 for a typical semi).

This revised estimation comes as a result of giving true consideration to the hidden costs involved in EWI – materials cost around £25 per sq m but other costs can include scaffolding (£10 per sq. m), labour, windows, alterations, roof extensions, fences / gates to remove, cables, satellite dishes and pipes to remove, boilers to adjust, plans / surveys to draw up, insulants and finishes. For a typical semi-detached house with 3 bedrooms the report estimates £7,600 (for material/insulation) plus £3,000 - £7,000 for the added extra costs highlighted above – so £10,600 - £14,600 in total.

EST estimated the cost of IWI to be around £4000 - £5,500 plus £1,000 - £3000 for extra costs (e.g. skirting / window board removal) – so £5,500 - £8,500 in total.

By developing a price guide and a buyer's guide to highlight the hidden costs associated with SWI, in a similar way to the RECC, consumers can evaluate quotes in a more informed and confident manner.

Community engagement

As well as increasing confidence in the energy efficiency measures by active performance monitoring, Arup also stress the importance of community engagement to develop local demand. This lack of engagement at community level can limit the growth of the mass retrofit market.

The 2013 Arup report recommends that retrofit programmes should ensure that they use all existing channels to engage with communities, including resident groups, forums and other community initiatives. Steering groups populated by local residents are also cited as important in guaranteeing that the programme has adequate support and buy-in from the local residents. Arup suggest that public organisations should allocate sufficient time and finance for stakeholder engagement when establishing retrofit programmes, leading to increased mass retrofit.

The report also suggests a subtle shift in the way factors relating to retrofit are prioritised as another potential way of addressing the lack of consumer demand for EE measures. Arup argues that the business case for undertaking retrofit work does not need to be entirely focused on energy bill savings. Instead, factors such as health benefits, reducing fuel, comfort and value generation should be considered equally as important. By focusing on these other factors, the decision to implement EE measures is not entirely dependent on their ability to massively reduce energy bills.

Following on from this, the report recommends that funding programmes (Green Deal) should include facilities for home improvement e.g. new front doors. In this way, EE measures can be promoted as more than simply domestic 'add-ons' or 'nice-to-haves', becoming standard features of high-value and desirable homes. Arup stress the importance of understanding the different ways to market retrofit. Many homeowners will not be persuaded to invest in EE measures by potential energy bill savings (especially considering the lack of confidence in them detailed above). Essentially, there is a need for more than one approach, and home improvement (in terms of value) is one alternative.

Inconvenience to homeowners

In their 2013 report, analysing a selection of Retrofit for the Future projects, the Institute for Sustainability highlight the fact that retrofit measures can cause a great deal of inconvenience to home owners. Indeed, in many cases homes become inhabitable and residents have to relocate for a significant period of time. This is a significant barrier to the uptake of EE measures.

The report also draws attention to the current lack of temporary heating systems to help manage the transition period between an old system and a new energy efficient one. This reduces the time period in which installers can do this type of work – in cold weather a home without heating is uninhabitable. In addition, the systems drive up energy bills considerably when in use.

The Institute for Sustainability report identifies a whole home energy measures plan as the way to conduct a whole house approach to retrofit without having to relocate residents. The plan would allow a number of extensive measures to be carried out over an extended period (25-30 years) when they are most cost-effective. This plan would ideally be used as a template to be rolled out across a number of residential properties in an area – with each measure being implemented across several homes at once. Not only is this convenient for the contractors (implementing EWI along a terrace is far more efficient than doing it individually), there is a significant cost saving to be made for the residents. Contractors who engaged with the Institute for Sustainability in their analysis of a selection of Retrofit for the Future projects estimated that mass retrofit (on a company or national scale) can reduce costs by up to 25 – 30%.

The rental of temporary heating systems should be taken into account when planning a retrofit project and its associated costs. Developing these temporary systems (technologically), and stimulating an increased rental market to lease them, will allow installers to do retrofit activity without relocating occupants. The report also states that occupants should be warned about the likely increase in the energy bills whilst the temporary system is in place.

Finance

57% of people in the Purple Market Research survey (OFT, 2011) who aren't actively considering adopting a microgeneration technology would require a 50% or greater reduction in upfront costs (typically £2000-£3000) in order to consider it. 63% of all respondents are only prepared to wait 5 years (or less) to recoup back their money, which is unfeasible for most microgeneration technologies.

In the Keeping FIT consumer futures research (2011) 25% of respondents were dissatisfied with the process of obtaining the FIT. The major concern is that the FIT is paid from the date of registration as opposed to commissioning. Consumers felt that documentation was too complex and there were often delays in FIT payments.

Landlord / tenant friction

In 2012, the Carbon Trust produced a Technology Innovation Needs assessment for domestic buildings in the UK. One of the barriers to retrofit market growth identified by the report was the lack of incentives for landlords to actively pursue energy efficiency measures across their building stock. Currently, the only beneficiary of energy efficient measures in a rented property is the tenant and this does not incentivise the landlord who would fund the changes. Despite the Green Deal removing the upfront costs the landlord would have to pay, repayments are taken out of the tenant's energy bill savings, and so more legislation is required to incentivise the landlord to improve their property.

One such piece of legislation was brought in January, coinciding with the launch of the Green Deal. From 13th January 2013, all advertisements for renting property are lawfully required to display an energy rating – this includes all printed and online media.[151] In addition to this, there is a provision under the 2011 Energy Act that will prevent landlords from letting properties that fall below a certain EPC rating (expected to be E) unless they have implemented the maximum number of measures possible under the Green Deal.

15.7 Conclusion

The purpose of this literature review was to identify what information is already available to address the five research objectives. The reports reviewed spanned a number of years and focused on different aspects of the renewable / energy efficient sectors – this meant that the information on domestic retrofit was very fragmented and did not necessarily present a cohesive picture of the market. With continually evolving policy and government support initiatives some of the information and data presented in the literature reviewed may now be outdated.

1. The scale (number of businesses, number of employees and turnover) of the retrofit market in the South West

   Whist the literature review provided some useful information regarding the total number of businesses involved in energy efficiency and microgeneration, the data was compiled several years ago and cannot be relied upon as a current indicator of population size. Green Deal data and information from trade associations was also limited. Furthermore, none of the data (other than Green Deal) relates specifically to the retrofit market. Whilst it can be presumed that many businesses involved in microgeneration / energy efficiency are involved in domestic retrofit activity, there is no way of determining the exact proportion of their work that this constitutes.

2. How each of the types of organisations along the value chain interact with each other to deliver retrofit projects

Although the literature reviewed did not offer any specific information regarding how the retrofit supply chain works, the initial qualitative interviews did convey the roles and responsibilities of different stakeholders active in the market.

[151] http://www.landlords.org.uk/news-campaigns/campaigns/epc-changes-9-january-2013

3. The opportunities for growth in the SW retrofit market

   The literature review identified a substantial opportunity for growth in the retrofit market on a national scale. With government schemes and low carbon initiatives in place to support the renewable / energy efficient sector, the market can be actively stimulated by supporting businesses in developing the local supply chain.

4. The barriers to organisations realising opportunities in the retrofit market

   Whilst there is a significant opportunity to develop the retrofit market there are many barriers and challenges to overcome. The main challenges to growth acknowledged in the literature review (on a national scale) could be separated into two categories – barriers to supply chain development, and barriers to demand stimulation. If the SW retrofit market is to meet opportunities for growth, the barriers to these two categories need to be overcome.

5. What can be done to remove barriers to enable more retrofit work to take place?

   In terms of helping both consumers and businesses, financial support was the predominant recommendation in the documents reviewed. For businesses, accreditation schemes are considered to be too expensive and inaccessible, and for consumers, upfront costs are thought to be too high and payback periods too long.

The literature review identified significant knowledge gaps in the following key areas:

- A lack of data regarding the size of the domestic retrofit market in the South West
- A lack of knowledge regarding how organisations and businesses work together as part of a supply chain to deliver domestic retrofit in the South West
- Whilst there are general national indicator, there is a lack of information related to the barriers / opportunities for growth specific to the South West

Quantitative and qualitative research undertaken with a range of South West businesses involved in different aspects of the domestic retrofit supply chain will address these knowledge gaps. This will provide Regen SW with current information, specific to the South West market, enabling them to help businesses stimulate the retrofit market.