

# Tweeddale Energy Efficiency Supply Chain Project



## Final Report May 2021

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### **1. Background.**

This work was commissioned by Scottish Borders Council (SBC) and funded by the South of Scotland Economic Partnership (SoSEP – the forerunner to the new South of Scotland Enterprise Agency SoSE).

The Report was written by Pip Tabor and Julie Nock of SUP Services and Randal Boydell of Ecohus Ltd with input and advice from Louise Cox and Neil Robertson from SBC for which we are most grateful.

There is broad agreement that, among many other actions, the targets set for reducing carbon emissions in Scotland and the UK will require a significant improvement in the energy efficiency (EE) of our homes and work-places. Efforts have been made in recent years to both incentivise and enforce actions that improve energy efficiency, but progress has been slow. One barrier to greater activity is the state of the “supply-chain”. The local trades people, designers and suppliers who can supply and install energy-efficiency measures are not yet adequately able to drive the process at the scale and rate required.

The situation with social housing is slightly different in that EE standards are being imposed through the EESSH 2 (Energy Efficiency Standard for Social Housing), with RSLs being required to ensure their homes attain certain EPC standards by certain dates, and hence they have made significant progress compared to other housing tenures. Similar standards are being applied to landlords in the private rented sector. No guidelines for owner occupied homes, the so-called “Able-to-pay” sector, have been established as yet but a recent consultation suggested all homes for sale to achieve EPC of C by 2024<sup>1</sup>.

**Table 1.1 Mandatory EPC Ratings for Housing**

<b>EPC</b>	<b>Social Housing</b>	<b>Private Rental</b>	<b>Owner Occupied</b>
E		1 Oct 2020: at change of tenancy 31 Mar 2022: all rental properties	
D	31 Dec 2025: at change of tenancy	1 Apr 2022: at change of tenancy 31 Mar 2025: all rental properties	
C			2024: at time of sale (suggested date for consultation only)
B	31 Dec 2032: all social housing		
A			

<sup>1</sup> <https://www.gov.scot/publications/energy-efficient-scotland-improving-energy-efficiency-owner-occupied-homes/pages/4/>

While this will improve standards to some extent, the targets are relatively modest and there are a number of exemptions, so not all properties will be upgraded to the target standard. It is worth noting that to get to net zero by 2045, as per the Scottish Government's Climate Change Act, wherever practical all houses will need to be better than the current A band specification, yet at the moment no targets to even reach A band have been set.

New buildings have to meet building standards set out in Building Regulations (Scotland) 2004, but these are still insufficiently rigorous and the Scottish Government is proposing a review of Section 6 of the regulations. It appears that for many new-builds, installing a 1kW PV array on the roof is considered sufficient, even though the roof, the inverter and the electrical mains connections could take a much larger array. It is also argued that standards for insulation, often referred to as "passive-house" standard, could be used to reduce the need for central heating to almost zero.

The big task (especially in our rural areas) is to improve the energy efficiency of existing homes and businesses which are of varying quality. About a third are built pre 1919 with traditional construction and solid walls. A similar number are built pre 1983 before modern building standards for energy efficiency were introduced.

There is a positive aspect to this, especially as the Covid-19 pandemic has had such an impact on the economy. There are big opportunities for businesses or social enterprises which can deliver the work that a green recovery is likely to demand. Helping more local businesses get themselves set-up to undertake such work will ensure that the local economy can benefit as much as possible<sup>2</sup>.

Increasing interest in the concept of building "Community Wealth" and supporting the local economy makes it all the more important to try to ensure that the demand for energy efficiency can be met by local suppliers. As it stands, the relatively modest demand for much EE work is largely being delivered by specialist contractors from out with the region.

#### **Our task.**

Southern Uplands Partnership Services Ltd were commissioned in 2020 to explore the issue in Tweeddale and take forward the recommendations from a previous study (see the Changeworks<sup>3</sup> and Nautilus reports 2018<sup>4</sup>).

We were asked to liaise with and support local businesses and to develop a network/association of these businesses across Tweeddale that would outlast the project.

This work included liaison between these businesses and organisations such as: Business Gateway, Borders College, Skills Development Scotland, the Energy Skills Partnership, Scottish Government and Scottish Borders Council.

We set out to enhance awareness and understanding between these stakeholders and other businesses in Tweeddale on what support is available and to try to grow both the supply and demand for energy efficiency initiatives across the Tweeddale area.

Specifically, we were asked to:

1. Identify and map all elements of a comprehensive local supply chain in energy services in Tweeddale
2. Confirm key issues and opportunities such as procurement issues, business administration, customer care, marketing, H&S, and other barriers to growth for the sector
3. Liaise between businesses and Business Gateway to provide appropriate support services
4. Liaise between businesses and Borders College to identify and deliver appropriate training
5. Support businesses with accreditation issues (including application process for Green Deal, MCS, etc) as required.

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<sup>2</sup> <https://www.gov.scot/publications/quality-assurance-short-life-working-group-report/>

<sup>3</sup> Nautilus ref needed

<sup>4</sup> <https://www.changeworks.org.uk/resources/energy-efficient-scotland-transition-programme-pilot-change-works-in-peebls-final-report>

6. Support construction sector businesses to access support from Resource Efficient Scotland for their own premises where appropriate and for them to further signpost clients.
7. Deliver an engagement programme with Tweeddale residents and businesses on energy efficiency actions, working with Change Works in Peebles project.
8. Establish a self-governing local supplier network

The following outcomes would be delivered:

- Development of a methodology to identify and map local supply chain showing numbers of businesses, key challenges and opportunities
- Identification of solutions to business growth challenges in conjunction with Business Gateway
- Establishment of a business network to support joint working and client engagement (Target - 12 members at end of pilot)
- Increased number of businesses trained/equipped in energy services including renewables (Target - 6 businesses undertaken training)
- Increased number of businesses accessing support including accreditation to the Microgeneration Certification Scheme, Green Deal, etc. (Target - 4 businesses accredited)
- Increased access to energy services contracts by local businesses
- Increased installation of measures by local residents and businesses delivering reduction in energy use and fuel poverty in the Scottish Borders.

## **2. The main outputs of the project include the following:**

1. We have identified and mapped all elements of the local supply chain in energy services in Tweeddale (see infographic below).
2. We have identified a number of key issues and opportunities (see infographic below)
3. We have sought to enhance the links between businesses and SoSE to better provide appropriate support services although the pandemic and the recent restructuring of SBC/SoSE and Business Gateway has made this awkward.
4. We have facilitated better links between businesses and Borders College to help identify and deliver appropriate training
5. The Covid-19 restrictions have made it difficult/impossible to support businesses with accreditation issues (including application process for Green Deal, MCS, etc).
6. The Covid-19 situation has also prevented us from being able to support the construction sector businesses to access support from Energy Efficiency Business Support for their own premises.
7. We have developed an engagement programme with Tweeddale businesses on a range of energy efficiency actions identified through interviews. It has not been possible to work closely with the Change Works in Peebles project as this project is in the process of being wound-up (although liaison with Changeworks has continued). Since January 2021 we have been working to extend this network across the whole of the Scottish Borders
8. We have progressed the establishment of a Zero Carbon Borders Construction Industry Forum which we hope will become a self-governing local supplier network.

From the outcomes requested we have made good progress on the first three:

### **2.1 Methodology used to identify the stakeholders, what do they do and the challenges they face?**

An excellent range of individuals have engaged with the project to date and have helped us to map the supply chain and the complex “support landscape” that exists around it. The infographic below illustrates the way various organisations relate to the energy efficiency sector.

**Trades** (predominantly one-person businesses). These are the builders, joiners, plumbers, electricians, etc. We estimate that there are in the region of 104 of these based in Tweeddale.

**Designers** - architects, engineers etc. who design and carry out the works that include energy efficiency measures. Estimated to be 22 in Tweeddale.

**Trade suppliers** –play a supporting role if they promote sustainable products and are critical in ensuring supply.

**Trade Associations.** These include the professions bodies that represent the various trades, sometimes setting standards and offering support including some training grants.










**Business Support Organisations.** These include Business Gateway, the Energy Skills Partnership, SoSE

**Training Providers and Accreditors.** The Local Colleges are vital providers of short and longer-term training for young and for existing trades people

**Energy Efficiency Organisations.** These are those who are promoting the need and setting the targets so Energy Savings Trust, Changeworks, Scottish Government, etc.

**The Local Authority and Housing Associations.** Representing local people

Infographic: Supply Chain Elements

customer owners & occupants	support funding & advice	process reports & approvals	supply chain contractors & suppliers	skills certification & training
PRIVATE HOMEOWNERS	EST energy saving trust	HOME ENERGY REPORT EPC	SURVEYORS • building surveyors • EPC/energy assessors • valuers	ESP 
PRIVATE LANDLORDS	EST EPC=D by 2022 energy saving trust	PAS2030 ASSESSMENT		BORDERS COLLEGE 
PRIVATE TENANTS	HEEPS/ECO ECO	SPECIALIST ADVICE HES	DESIGNERS • architects/designers • engineers • quantity surveyors	PROFESSIONAL INSTITUTES RIBA/RIAS/RICS/ACE/CIBSE
BUSINESS OPERATORS	ZWS 			
COMMERCIAL LANDLORDS	ZWS 	PLANNING APPROVAL changes to external envelope or conservation area	BUILDING CONTRACTORS • builders • carpenters & joiners • roofers • insulation installers • bricklayers/stonemasons • painters/decorators	FMB 
HOUSING ASSOCIATIONS	EESHH 	BUILDING APPROVAL changes to structural fabric or drainage		
SOCIAL HOUSING TENANTS	Borders Home Energy Forum 	CONNECTION APPLICATIONS electricity, water, drainage, gas	SERVICES CONTRACTORS • plumbers/gasfitters • electricians • renewable installers	NICEIC/SNIPEF 
COMMUNITY BODIES	EST energy saving trust	SUPPLY AGREEMENTS RHI grant, Power Purchase Agreement		
PUBLIC BUILDINGS	NZCPSB 	PRIVATE QUOTES	SUPPLIERS • builders merchants • specialist suppliers e.g. windows • sales reps	
PUBLIC INFRASTRUCTURE		PUBLIC TENDERS		

Since commencing this work, the Covid-19 situation has severely constrained opportunities to meet with people face to face. Attempts have been made to contact all trades and where there has been interest, a questionnaire has been used to capture data and views on a range of issues (see annex). Other work has had to be done remotely using phone, Whatsapp, Zoom and other on-line platforms. While this has hindered progress in some areas, it has not prevented us making good progress on other aspects of the work

There is little doubt that there is a strong consensus that energy efficiency urgently needs to be improved in homes and businesses. The messages from the Government, from the trade bodies, from training providers and from the Local Authority are all flagging the opportunity and calling for more action. The need to increase the level of skills is also widely recognised (see for example the report from Skills Development Scotland:

<https://www.skillsdevelopmentscotland.co.uk/media/47336/climate-emergency-skills-action-plan-2020-2025.pdf> )




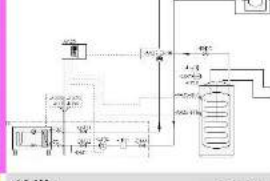
It has been estimated that on average, it would cost £26k to get a house up to the standard required to meet the current carbon target. (see analysis based on data from the Climate Change Committee:

<https://www.theguardian.com/environment/2021/jan/23/buyers-of-brand-new-homes-face-20000-bill-to-make-them-greener> )

If that work was spread out over the next 25 years until 2045, the legal deadline for Scotland to be net zero carbon<sup>5</sup>, that would represent a 50% increase in the current size of the house building and maintenance sector. This demonstrates the significant scale of the challenge and the opportunity.

Infographic: Key Issues and Opportunities

<sup>5</sup> Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 which sets a legally-binding “net-zero” target of all greenhouse gases by 2045

drivers	research	challenge	tasks	needs
 <p><b>Net Zero</b> The UK's contribution to stopping global warming</p> <p><b>UK Climate Change Act</b></p> <ul style="list-style-type: none"> <li>2050: UK net-zero carbon</li> <li>2045: Scotland net-zero carbon</li> <li>2025: no new homes on gas grid</li> </ul>	<p><b>Trades</b></p> <p>Builders &amp; Designers in Tweeddale:</p> <ul style="list-style-type: none"> <li>200+ businesses contacted</li> <li>100+ received regular updates</li> <li>30+ interviewed</li> </ul> <p>Of those interviewed:</p> <ul style="list-style-type: none"> <li>2,400+ EE installations last 2 years</li> <li>£5m+ in value</li> <li>70% sole traders / micro business</li> <li>40% member Industry association</li> </ul> <p>Broader outreach:</p> <ul style="list-style-type: none"> <li>3,700+ Facebook highest reach</li> <li>900+ fliers distributed</li> <li>6 webinars / 150 online views</li> </ul>	<p><b>Houses</b></p> <p>Borders: 58,000 houses</p> <ul style="list-style-type: none"> <li>RSL: 20%</li> <li>PRS: 15%</li> <li>Owner: 59%</li> <li>Vacant/2nd: 6%</li> </ul> <p><b>Businesses</b></p> <p>Borders: 6,000+ businesses</p> <p>Construction sector: 2,500+ jobs</p> <p>Vast majority are small businesses:</p> <ul style="list-style-type: none"> <li>sole trader: 36%</li> <li>micro SME (&lt;10): 56%</li> <li>SME (10-250): 7%</li> <li>Large Enterprise (&gt;250): 1%</li> </ul>	<p><b>Building Fabric / Energy Efficiency</b></p> <ul style="list-style-type: none"> <li>Insulation to Fabric &amp; Pipes</li> <li>Windows &amp; Doors</li> <li>Airtightness &amp; Ventilation</li> </ul> 	<p><b>Construction Sector</b></p> <p>To meet the scale of challenge:</p> <ol style="list-style-type: none"> <li>Upskill existing trades</li> <li>Encourage new businesses</li> <li>Support social enterprises</li> </ol> <p>To provide confidence:</p> <ul style="list-style-type: none"> <li>Confirmation of funding</li> </ul> <p><b>Cost: £60M/y 25 years</b></p> <ul style="list-style-type: none"> <li>Start with social housing</li> <li>Knowledge flow to private sector</li> <li>Coordination and support</li> <li>Establish Construction Forum</li> </ul>
<p><b>Energy Efficient Scotland</b></p>  <p><b>Energy Efficient Scotland</b></p> <ul style="list-style-type: none"> <li>2022: private rented homes EPC: E</li> <li>2032: social rented homes EPC: B</li> <li>2040: all private homes EPC: C</li> </ul>	<p><b>Stakeholders</b></p> <p>Broad range of stakeholders engaged:</p> <p><b>Public Sector:</b></p> <ul style="list-style-type: none"> <li>Energy Saving Trust</li> <li>Borders Home Energy Forum</li> <li>Housing Associations</li> </ul> <p><b>Skills &amp; Training:</b></p> <ul style="list-style-type: none"> <li>Energy Skills Partnership</li> <li>Borders College</li> </ul> <p><b>Trade Associations:</b></p> <ul style="list-style-type: none"> <li>CITB</li> <li>FMB</li> <li>SNIEF/NICEIC</li> <li>MCS</li> </ul>	<p><b>Cost</b></p> <p>Retrofit: £26,000/house*</p> <p><b>Scottish Borders: £1.5B</b></p> <p>Complete by 2045 = 2,320 houses/y</p> <p><b>Cost: £60M/y 25 years</b></p> <p>current industry output: <b>+50%</b></p> <ul style="list-style-type: none"> <li>Significant market opportunity</li> <li>More than just "another apprentice"</li> <li>Demand will depend on funding</li> <li>Activity period limited to 25 years</li> <li>Doesn't suit current business model</li> </ul>	<p><b>Building Services / Renewables</b></p> <ul style="list-style-type: none"> <li>Electricity / solar PV</li> <li>Heating / heat-pumps / biomass</li> <li>Energy storage / controls</li> </ul> 	<p><b>Training Sector</b></p> <p>All need the same type of training.</p> <ul style="list-style-type: none"> <li>Courses and Places do exist</li> <li>Getting commitment in lieu of working time hard for small traders</li> <li>Shared apprenticeships</li> <li>Retrain redundant workers</li> </ul> <p>Alternative routes:</p> <ul style="list-style-type: none"> <li>Digital Learning v hands-on</li> <li>Mobile classrooms</li> <li>Fast track training courses</li> <li>Maintenance and handyman</li> </ul>
<p><b>Renewables</b></p> <p>Reviewed MCS micro-renewables:</p> <ul style="list-style-type: none"> <li>78,000+ installations in Scotland</li> <li>3,600+ installations in Borders</li> <li>7.6kw average capacity</li> </ul> <p>For the different technologies:</p> <ul style="list-style-type: none"> <li>Solar PV: 2,606 units / 11,384kw</li> <li>Biomass: 353 units / 10,390kw</li> <li>Heat Pumps: 558 units / 5,285 kw</li> </ul> <p>Carbon savings:</p> <ul style="list-style-type: none"> <li>10,000+ t CO2 saved per year*</li> <li>3 x Scotland average CO2 saving*</li> <li>50% of CO2 saving from biomass offsetting fossil fuel (oil/gas) heating</li> </ul>	<p><b>Carbon</b></p> <p>Household: 8 tCO2e/y*</p> <ul style="list-style-type: none"> <li>Heating: 29%</li> <li>Electricity: 21%</li> <li>Transport: 34%</li> <li>Aviation 12%</li> <li>Waste: 4%</li> </ul> <p>Energy saving: £430/y*</p> <p><b>Financial Payback: 60 years</b></p> <p>Embodied carbon: 24t CO2e/house*</p> <p><b>Carbon Payback: 6 years</b></p>	<p><b>Skills</b></p> <p>Training:</p> <ul style="list-style-type: none"> <li>National training strategy</li> <li>Colleges &amp; Industry</li> <li>Supported by Trade Associations</li> <li>Public funding is available</li> </ul> <p>Accreditation:</p> <ul style="list-style-type: none"> <li>PAS 2030 standard coming in</li> <li>MCS for micro-renewables</li> </ul> <p>To meet the challenge:</p> <ul style="list-style-type: none"> <li>Raise awareness within Trades</li> <li>Provide clear path to accreditation</li> <li>Look at fast track/hybrid options</li> <li>Reskill workers from other sectors</li> </ul>	<p><b>Supply Chain</b></p> <p>Integration with broader supply chain:</p> <ul style="list-style-type: none"> <li>Designers (architects &amp; engineers)</li> <li>Builders Merchants</li> <li>Manufacturers</li> <li>Planning &amp; Building Approvals</li> </ul> <p><b>Economic benefits:</b></p> <ul style="list-style-type: none"> <li>Encourage local manufacturing</li> <li>Enhance social outcomes</li> <li>Increase employment</li> </ul> <p><b>Carbon benefits:</b></p> <ul style="list-style-type: none"> <li>Natural low-carbon materials</li> <li>Insulation: plant fibre/wool</li> <li>Timber: structural/cladding</li> </ul>	
<p>Legal and regulatory framework being put in place.</p>	<p>Positive engagement across all stakeholders.</p>	<p>Radical &amp; rapid step change in scale of work.</p>	<p>Upgrade in skills required across all trades.</p>	<p>Actions possible and proven but need coordination.</p>

## 2.2 Barriers to progress and Possible Solutions

We identified and contacted 205 businesses. Of these, 108 now receive regular updates from us (67 on Whatsapp, 21 email, 20 mobile).

53 agreed to be interviewed, 31 were interviewed (interview time 30-60 minutes). Of these 22 were tradespeople (joiners, plumbers, builders, electricians) and 9 were architects/designers/engineers.

Business types interviewed: 21 Sole Traders, 1 Micro Business, 9 Limited Companies. 13 were members of an industry body and 22 expressed interest in the formation of a local network.

Collectively, interviewees had worked on 2,474 EE installation measures (insulation, windows and doors, ventilation, heating, electricity) in the last two years with an estimated value of £5,065,000

All active contacts (108) were offered training, workshops and site visits in EE to be delivered by Borders College and private contractors. 13 businesses and their employees are interested in the following: Insulation Workshop x10, EPC Workshop x10, Air Source x10, Ground Source x10, Solar Thermal x8, Mechanical Heat Recovery x8, Electric Car Charging x8.

37 people would like a tour of the STEM Hub in Hawick

15 businesses expressed an interest in a shared apprenticeship if such a scheme were available

Further information on contact methods, interviews and training requirements can be found in the appendices at the end of this document.

### **Awareness**

From our discussions with local trades, there is some appreciation of the importance of EE. Indeed, some businesses have had experience of previous “green” schemes although these have left some of them unimpressed and even suspicious. It seems that most local trades people are as busy as they want to be. Many have jobs lined up for many months ahead. Some work may include EE measures, but these are rarely the main objective. EE can be seen to be difficult – requiring significant disruption (especially if the properties are of a certain age) and anecdotally it seems some trades may highlight the difficulties of some EE retrofit measures rather than rather than encouraging them.

### **Renewables**

Interestingly, the data from the MCS (Microrenewables Certification Scheme) indicates that Tweeddale is actually doing well in relation to green energy installations, with the number of systems installed twice the Scottish average on a population basis, resulting in estimated carbon savings of more than 3.6 times the average. This data covers all 78,000 micro-renewable systems registered by MCS in Scotland since 2012 and so provides a comprehensive reference source.

It could be assumed these outcomes are due to the rural nature of the region, with more land available for installations, a ready supply of timber for biomass fuel, and more buildings which do not have access to mains gas for heating. Whilst we cannot tell what proportion of the installations was done by local contractors, it is reasonable to assume many of them would have been, and this suggests the local industry does have a good awareness and experience with renewable energy as part of EE works. Importantly, it also indicates that local demand is significantly greater than the Scottish average in terms of both numbers and capacity.

### **Extract from Renewable Energy Installations Data Analysis Report**



**Table 2.2 Installations on a Population basis**

	<b>Tweeddale</b>	<b>Borders</b>	<b>Scotland</b>
<b>Population</b>	21,215	115,270	5,455,000
<b>% Scotland</b>	0.4%	2.1%	-
<b>Number installed</b>	654	3,615	77,992
<b>% Scotland</b>	0.8%	4.6%	-
<b>x Scotland</b>	2.0 x	2.2 x	
<b>Total Capacity</b>	5,914 kw	27,476 kw	472,747 kw
<b>% Scotland</b>	1.25%	5.81%	-
<b>x Scotland</b>	3.1 x	2.7 x	
<b>Average Capacity</b>	9.04 kw	7.60 kw	6.06 kw
<b>% Scotland</b>	+49%	+25%	-
<b>x Scotland</b>	1.5 x	1.2 x	
<b>CO2e saved/year</b>	1,556 t	10,441 t	116,280 t
<b>Per person</b>	114 kg	91kgt	31 kg
<b>x Scotland</b>	3.6 x	2.9 x	

This suggests that local awareness and interest amongst “clients” is actually quite high which should provide very strong encouragement for local contractors to up-skill and expand their business offering for small scale renewable energy systems.

We have tried to make something of this in the local press, so far without success, which raises questions about how the local media can be encouraged to find the issue of interest.

### **Scale**

The large majority of trades people in Tweeddale (and we suspect in most rural areas) are micro businesses i.e. sole traders or minimal staff. Across the UK as a whole, over half of construction firms working on domestic buildings are sole traders or have only 1 employee, and about a third of all staff work for firms with no more than 3 employees (ONS Construction Statistics 2019). There is some collaboration going on between trades, but it is largely informal, with people working together when needed. More formal arrangements are scarce.

At present, larger contracts for EE work (e.g. from RSLs) are going out to tender and being awarded to companies from out with the area even where there is a preference for using local firms. Either local trades lack the requisite skills (and/or accreditation) or they are simply too small and inexperienced to successfully tender.

We heard of cases where successful tenderers subsequently sub-contracted some of the work locally but at a lower-than-normal rate which created bad-feeling.

In theory, small businesses could increase capacity by taking on additional workers or apprentices. When asked about this as a way of increasing ability to tackle larger jobs, businesses point out that this is a significant and unwanted additional burden in terms of bureaucracy.

These factors place a limit on the scale of work that can be undertaken by many local businesses, and makes bidding for larger contracts almost impossible. Collaborative tenders would increase the chances of success, but these would require time and effort and might have more chance of success if some of facilitation was available.

### **Type of housing**

The most common type of housing in Tweeddale is pre-1919 traditional construction for which EE is more problematic than for more modern buildings. Stone walls and coombed ceilings make installation of insulation more difficult. Such hard to insulate houses require skills (and accreditations) that most local trades do not have. At present, where there is a call for this sort of work, it tends to be done by specialist contractors from out with Tweeddale or the Borders.

### **Training**

Getting the appropriate training is an expense (and requires time away from work) and is therefore not seen as a high priority unless there is a really good reason (or requirement) for it. While there are grants available to subsidise the cost of training, the schemes are complex and not available to all (e.g. sole traders do not qualify for financial support). Trades are busy enough as they are undertaking property upgrades, repairs and refurbishments and the lack of accredited training does not seem to be a limitation to their viability at present.

### **Cost and logistics**

Getting clients to undertake energy-efficiency measures, and to install the most appropriate and green systems benefits from an enthusiastic installer and workforce. At present the cost tends to be a disincentive and uncertain trades can sway clients away from undertaking such EE work.

More support through grants or loans would help address the cost issue and more awareness raising for the trades would make them more effective advocates for change.

### **Leadership**

While there is growing awareness of the need for greater EE, there is still too little leadership in relation to the urgency. EE is hardly mentioned in the press and the Local Authority has only recently declared a climate emergency. While the issue is perceived to be of marginal importance, people are going to tend to take the easy (and cheapest) options.

### **Performance measures.**

Currently energy performance is assessed using Energy Performance Certificates (EPCs) which are assessed by trained surveyors. EPCs are criticised for various reasons, including: they often provide an inaccurate assessment of existing building fabric; predicted energy use can significantly underestimate actual use for new buildings (called the “Performance Gap”) and; their recommendations for improvement works are sometimes impractical. But whilst their calculation methods can be rather opaque they do at least provide a consistent industry standard and are playing a key role in driving up EE for both houses and commercial properties. Some trades people we spoke to felt they did not understand EPCs or what could be done to improve their performance. If the system was better understood, work that would enhance EPCs could be promoted by the trades. This lack of understanding is an area we think could be relatively quickly improved.

### **Broader Sustainability Outcome – local manufacturing, embodied carbon and circular economy**

The sheer scale of work required presents an opportunity for not only the trades but for the whole supply chain in two significant ways. Firstly, whilst the manufacture of high-tech components like solar panels is part of a global supply chain which would be difficult to change, many basic construction materials could be manufactured on a local or regional basis. Secondly, the manufacture of many of the current energy efficiency solutions for things like insulation are themselves responsible for very high carbon emissions, and so it is essential that low-carbon options are made available. Putting these two things together, there is the potential for the Borders to develop local manufacturing that utilises its abundant natural resources to produce EE construction materials that embrace low carbon and circular economy principles. Some local businesses are already doing this, such as BSW Timber who are already working with the Construction Scotland Innovation Centre (CSIC) on a range of sustainability projects, or the innovative Indinature business which makes hemp insulation and are establishing their factory in Selkirk and contracting with local growers. This approach would provide added employment and social benefits as part of a sustainable local economy.

## **2.3 The Need for a Construction Network or Forum**

Some years ago, there was a Borders Construction Industry Forum, initially set-up and funded by Scottish Enterprise and hosted by Borders College. This played an important role in bringing the stakeholders together, raising issues of concern and ensuring communication was effective. It is widely agreed that the demise of this forum has left a

vacuum. Our plan was to recreate a forum at a local Tweeddale-scale through the running of local events. Clearly this is not going to happen for some time now due to the Covid-19 restrictions. The need for the Forum however is so clear that a proposal for a Borders Forum is now being taken forward as the final part of the SoSEP funded project. Ongoing support for the Forum will require additional resources to be identified. Discussions with SoSE are being held to explore this possibility. It is interesting to note that a local forum has been established in D&G where the “Developing the Young Workforce” partnership is successfully bringing employers together to discuss the needs of the sector.

### **Conclusions:**

In addition to the establishment of the Forum, as referred to above, we see that there are three other "needs" to support the rapid upscaling of the EE supply chain.

1. We need to get more of the existing trades/businesses up-skilled so that they can deliver the work that will be forthcoming as we move to zero carbon. We suspect this needs a local training fund to effectively “pay” suitable people to get trained. This could be a short-term (post covid) scheme that would need to be supported by Borders College (and probably D&G Collage as well). This support might consist of administering such a scheme as well as providing the training courses.

2. We need to encourage new enterprises to add to the capacity across the Borders. Even if all the current businesses get trained, there will still not be enough to do the required work, and our research suggests that most of the smaller traders are unlikely to want to expand their number of employees anyway. This might be via road shows, films or promotions to make more people aware of the opportunity.

3. We need to find a way of helping small businesses work collaboratively to deliver larger (and more cost-effective) contracts. We think there may be an opportunity for a social enterprise to facilitate this - coordinating collaborations and helping with bids for work. A short feasibility study is needed to explore how viable such an idea is. Such a body might also be able to coordinate shared apprenticeships - which are seen to be an attractive prospect by many.

### **3. Training and the role of Colleges**

Borders College is clearly keen to provide appropriate EE training opportunities to local businesses. It has already installed a good range of modern EE and renewable energy equipment at the STEM hub in Hawick in partnership with Dumfries College. There are plans to install more equipment however this has been delayed by the virus. The problem appears to be that the training offered, while good for school leavers, is not of the type or in the form wanted by the trades. Unfunded time-out of work is seen as a significant expense. At present the need for certified training is not impacting on the amount of work available so there is little incentive for trades to get up-skilled.

The target audience for up-skilling is also problematic since in Tweeddale (and other rural areas) the vast majority of businesses are very small – often a single person. For such businesses, it is very hard to justify taking time out for courses of any sort, and if there is also a cost involved for the course, the economics simply do not stack-up. At present, sole-traders do not qualify for training-support grants. On-line training may be more attractive, but for practical skills it is unlikely that on-line courses will be sufficient.

Our initial on-line “retrofit” event targeted at trades people attracted only a small audience and post-event feedback suggested that while the content was very well received, the trades who did engage found the Zoom events “uncomfortable”, not being familiar with the technology, not having the confidence to ask questions and not liking the fact that they could be seen. Future events will start with an introduction to zoom to try to overcome these issues, but it seems likely that many will not want to engage through this media.

Another option is to take courses out of colleges so they can be delivered closer to the target audience. Mobile courses can be offered, but they may need additional resources to allow kit to be made mobile.

Borders College are considering means of increasing engagement with local construction businesses to better understand training needs and to tailor appropriate opportunities. This again highlights the need for a construction industry forum which could improve such understanding. Steps are being taken to promote this idea and it may be that there is a role for Borders college in supporting such a forum.

### **4. Improving Demand and Overall Awareness**

The plan was that in June 2020 we would have held the first of a series of networking events. These evening events were going to be themed on a facet of energy efficiency and combine a relevant speaker, a light supper and some semi-structured networking/workshop sessions. The Covid-19 situation made this difficult and online information sessions were organised from October 2020 to February 2021 to provide information for trades people on retrofitting traditional buildings and on renewable technologies. The webinars were advertised through project fliers, Whatsapp, email and a Facebook page for the project.

We originally intended to simultaneously stimulate demand for EE measures from householders working with Change Works in Peebles (CWIP). This has also been stymied, both by the lock-down and the ending of the CWIP project. It is hoped that the talk of a “green-recovery” will result in an increased interest in EE from householders and businesses and that this might be backed-up with support in the form of grants or loans. This would generate more demand and this in turn should incentivise improved supply-capability.

### **5. Broader Issues**

It is clear to us that there is a consensus that the structure and management of local EE services needs to change and that this need for change is urgent.

We all know we should be doing more to reduce carbon emissions, but if it is difficult to find out what one should be doing for the best, if finding sources of accurate and reliable information is hard or if taking appropriate action is too costly or difficult, the easiest thing to do is nothing.

Ideally, a householder would be getting information and advice from the tradespeople they contact which would encourage energy efficiency measures. Such “trusted advice” would be of significant value in encouraging EE measures. We suspect at present some tradespeople may be advising against taking such measures because of the cost or apparent uncertainty, and few are actually promoting such works.

At present there are a number of sources of information, from a range of organisations such as Local Energy Scotland, Home Energy Scotland, the Energy Saving Trust and Changeworks. The advice landscape is cluttered and can be confusing. In addition, cold calling by dubious private companies adds to this complexity and in fact causes suspicion.

We suggest there is also insufficient leadership. There is no obvious local voice calling for urgent action and there is no consistent message coming from trusted sources. Most politicians are quiet on the issue. The new Enterprise Agency has yet to set-out its stall. The Scottish Government has set an ambitious target for 2045, but has yet to detail how this target will be met. Without a consistent call to action, people will take the easy route and make minimal changes.

## **6. Next Steps**

We have started to identify what needs to change if we are to meet the targets that have been set – net zero by 2045 and interim targets for energy efficiency and EPC bands. What training is needed? What barriers need to be confronted? What additional resources might be needed? Which systems are obstructing progress? We feel there is merit in celebrating successes and researching causes of failure so that lessons can be learned. The industry generally and local installers in particular, operate under a range of constraints, including financial and time commitments required to gain the necessary accreditations. It is important that these are understood and allowed for to give future schemes the best chance of success.

Some of these issues are included in a review of the Energy Efficient Scotland Pilot Projects, prepared for the Scottish Government by the University of Edinburgh and the Energy Saving Trust in November 2018<sup>6</sup>. Some of its conclusions for domestic retrofit included:

- Engaging households who are not in fuel poverty will need more detailed and accurate data, including access to smart meter data.
- Multi-year funding for long term, area-based, programmes is likely to support higher recognition, momentum and uptake of domestic energy efficiency measures by building a positive reputation in communities.
- Systematic information and education is needed at the point when households are adjusting to higher energy efficiency and/or new heating systems, to ensure that comfort is combined with energy savings

The reports final overall conclusion was that:

- Regardless of the outcome of negotiations, more long-term dedicated local and central government staff resources will be needed for the large scale EES programme. This will provide the capacity and flexibility to innovate and adapt programmes to economic, organisational and cultural circumstances. Cooperation and coordination across local and national levels will be critical to success.

We are still considering the development of an on-line “portal” website –this would aim to both promote the local services that are available in Tweeddale and encourage people to consider taking steps to improve energy efficiency. Links could be included to relevant sources of advice, grants, and case-studies. Such a portal would be much more effective if developed at a local authority or regional scale.

There is a clear need for up-to-date data on properties, construction type, heating, insulation, EPC rating etc for either domestic or commercial properties. Without this it is very hard to understand the scale of the task and the

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<sup>6</sup> <https://heatandthecity.org.uk/wp-content/uploads/2018/11/EES-Pilot-Evaluation-Phase-1-Final-Report1.pdf>

demand for skills. Establishing such a dataset is key for developing the strategy and setting targets. This is what the RSLs are doing for their housing stock to identify their priorities and challenges

Alongside these actions, we would hope to continue to work with partners to promote the urgent need for greater energy efficiency across Tweeddale to meet the net-zero target. Clearly CWiP has made an excellent start on this with home and business owners but the campaign needs to continue and grow. Social media can play a role in this – but we suggest it would be useful if funds could be found for a hard-copy flier campaign that would deliver a leaflet to every household and business in Tweeddale – the main objective of these would be to flag-up the website and the network as a source of useful local information and contacts. We would also seek to use a range of media to raise awareness of the business opportunities.

We have identified a range of examples of projects that have already taken energy efficiency measures (households or businesses) and which may be willing to share their experience with those considering taking similar action. Real life experience of local people is always likely to gain more attention than anonymous and generic statistics.

The brief asked us to establish a network of supply chain businesses which could become a more formal self-governing organisation or forum. The pandemic made the network difficult/impossible but the project Steering Group has effectively become this Forum. We are now working to help it improve awareness, encourage up-skilling, improve communication between stakeholders and help coordinate more collaboration between trades in the area. We have identified some interested individuals and others are being encouraged to join. Current funding allows us to support the Forum until the end of 2021 but the body will need to be resourced to maintain this network.

## **Appendices**

### Section A: Client Engagement

1. Methodology
2. Contact methods, interviews and results
3. Training, accreditation pathways, funding and webinars
4. Direct messaging, social media, press, fliers and web
5. Project questionnaire

### Section B: Renewable Energy Installations Data

1. Introduction
2. Installations
3. Technologies
4. Carbon
5. Conclusions

## **A1 Supply Chain Development - Engagement Methodology**

### **Supply Chain Development - Methodology**

Our planned methodology to engage and develop the supply chain, provide training and form a core network by project end was to:

- Identify all tradespeople in Tweeddale and the wider trade supplier network.
- Develop a questionnaire to inform the project on types of business, current levels of EE use, training and certification requirements and highlight any issues that might affect uptake. This information would be used to design accredited training, workshops, information sessions and site visits to upskill the sector and bring likeminded individuals together to form a core group.
- Contact and interview tradespeople
- Identify training needs and networking opportunities from survey responses
- Develop training, information sessions, networking opportunities and site visits
- Provide training with clear routes to accreditation
- Develop network and form a core group to take project forward

### **Headline Statistics**

Identified and contacted 205 businesses. Of those, 108 received regular updates (67 on Whatsapp, 21 email, 20 mobile).

53 agreed to be interviewed, 31 were interviewed (interview time 30-60 minutes). Of those, 22 were tradespeople (joiners, plumbers, builders, electricians) and 9 were architects/designers/engineers.

Business types interviewed: 21 Sole Traders, 1 Micro Business, 9 Limited Companies. 13 were members of an industry body and 22 expressed interest in the formation of a local network.

Collectively, interviewees had worked on 2,474 EE installation measures (insulation, windows and doors, ventilation, heating, electricity) in the last two years with an estimated value of £5,065,000

All active contacts (108) were offered training, workshops and site visits in EE to be delivered by Borders College and private contractors. 14 businesses and their employees were interested in the following: Insulation Workshop x10, EPC Workshop x10, Air Source x10, Ground Source x10, Solar Thermal x9, Mechanical Heat Recovery x8, Electric Car Charging x9.

37 people would like a tour of the STEM Hub in Hawick

15 businesses expressed an interest in a shared apprenticeship if such a scheme were available

950 fliers distributed

3 press releases

Facebook page (after 6 months) 30 followers, 26 likes, 3.7K combined post reach

3,350 successful and attempted contacts via phone, SMS, Whatsapp, email and direct social media messaging

6 webinars (+/-30 minutes each) with 49 participants and 149 online views

## **A.2 Contact Methods, Interviews and Results**

### **Contact Methods**

The sector is notoriously difficult to engage and we had planned to undertake the majority of contact face to face to ensure maximum project exposure and uptake. Unfortunately, our activities were severely curtailed as the first phase of the project (start date April 6<sup>th</sup>) had to operate within UK wide Covid-19 restrictions making it extremely difficult to contact people and impossible to conduct any face-to-face engagement.

The project inherited a list of 105 (67 active) contacts in Tweeddale and identified a further 100 through web searches on Yell, Cyclex, Facebook, Google, Thompson Directory and 'find my builder' type sites. All contacts (as they were predominantly mobile numbers) were fed into Whatsapp to see if this was a viable route to directly contact tradespeople. The search provided 67 valid contacts and was deemed the most efficient method to inform and engage tradespeople.

Between April and June 2020 repeated attempts (between 4 and 8 per business) were made to call, email, text and private message (through social media pages and Whatsapp) all contacts (205) to request an interview. Most were not answering their phones and did not respond to voice or text messages. Those that accepted the call were difficult to keep on the line long enough to explain the purpose of the project and there were a number of phone slams and 'not interested' call cuts. Landlines were not being answered until July 2020 when people began to return to their places of work.

In order to raise awareness and support the project 450 fliers were produced in June 2020 which were distributed through 16 local trade suppliers in Galashiels, Tweedbank and Penicuik to trade customers through deliveries and trade counter sales. This did not appear to increase call response rate as intended though some mentioned having



received the flier. A second round of 500 fliers were produced in October and distributed through the same network to increase awareness of the planned training initiatives. The second round helped to raise awareness and increased uptake of the planned training.

The following table outlines the range of contact responses:

Table 1: Interview Contact Response

Number of Trades People	Response Type	Percentage Response
2	Happy to be interviewed but no time to take call	1%
3	Moved out of area	1.5%
6	Put the phone down	3%
7	Not relevant for their business	3.4%
9	Retired or retiring this year	4.4%
10	No longer in business	4.8%
10	Arranged an interview time but didn't answer the call	4.8%
12	Arranged an interview time then changed their mind	5.8%
12	Telephone line doesn't receive incoming calls	5.8%
12	Not interested	5.8%
15	No such number (from original list and no alternative)	7.4%
16	No listing (names given without contact details)	7.8%
31	Interview complete	15.2%
60	Repeated messages via mobiles, landlines, email and whatsapp – no response	29.3%
205		100

## Interviews

The project compiled a list of 41 questions which outlined type of business, qualifications, employees, training undertaken, completed energy efficiency work and estimated value, training required or interested in and general questions on perception of the energy efficiency market. Not all questions were of relevance for each business.

53 (26%) agreed to be interviewed, 31(58%) accepted the call. Interviews were conducted for a period of 30 - 60 minutes. The following types of companies and industry sectors completed an interview:

Chart 1: Types of Businesses Interviewed

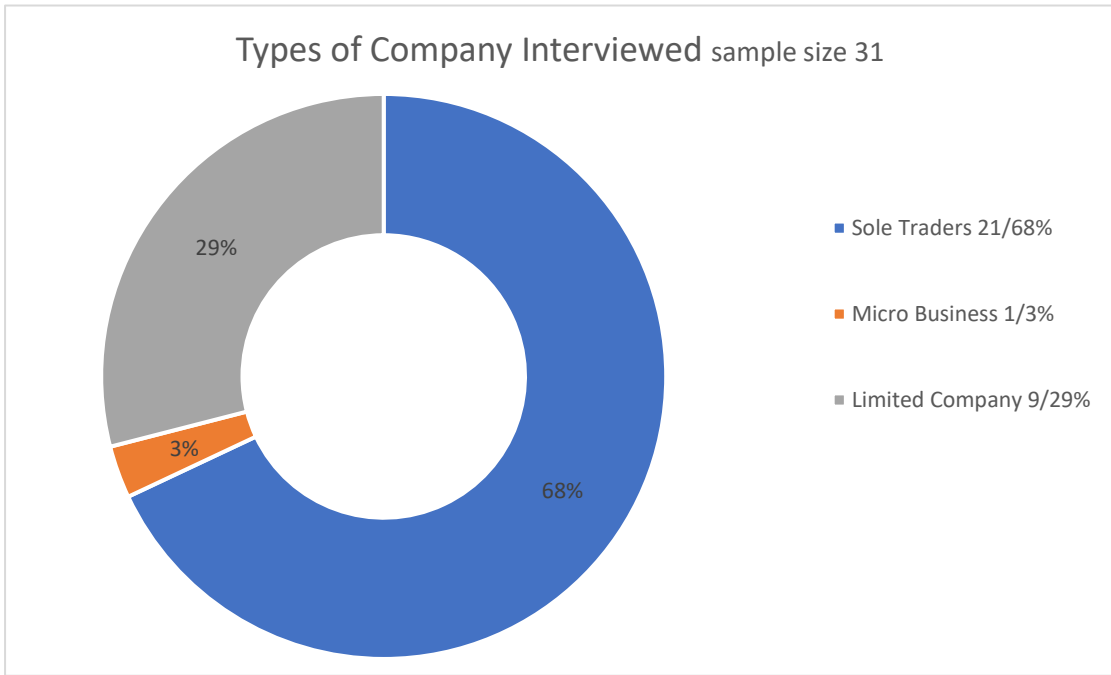
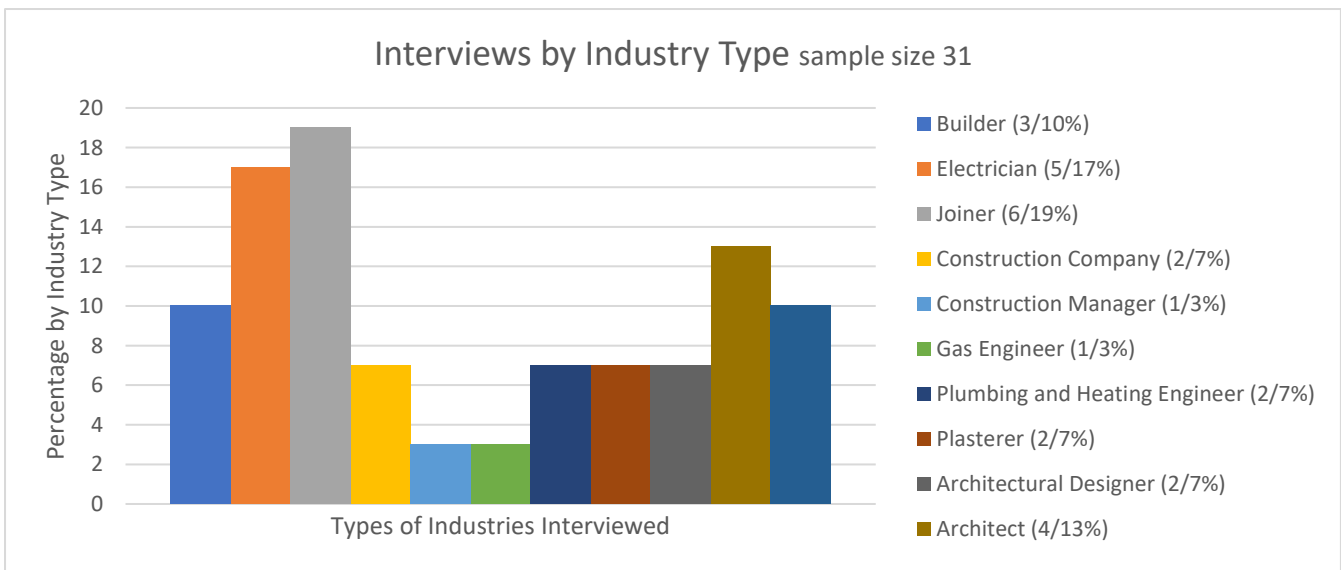


Chart 2: Industry Type

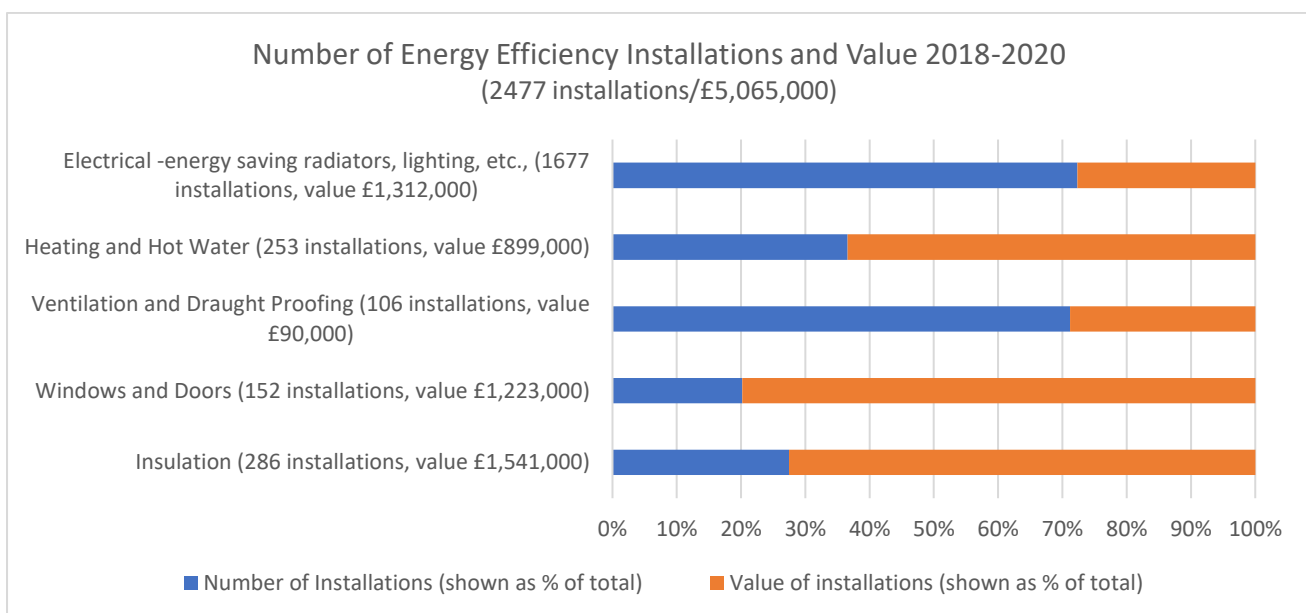


## Results

Interviewees shared the following information:

- **Professional Membership:** 13/42% currently registered with a professional body, 6/18% used to be members of a professional body, 12/40% are not registered.
- **Education:** 8/26% Time Served, 9/29% Degree Level, 11/35% SVQ, 3/10% HND
- **Network:** 22/71% would be interested in a network, 6/19% unsure, 3/10% not interested
- **Working with Other Tradespeople:** 16/52% businesses work regularly with an average of 5 other trades ( i.e. builders, plumbers, joiners, plasterers, heating engineers), 1/3% with main contractors only and 1/3% with structural engineers only. 13/42% do not work with other trades.
- **Working Area:** 77%/24 predominantly work within their local area (75% and above of completed work)
- **EE Contracts:** 97%/30 believed biggest hurdle for homeowners to undertake EE improvements was lack of capital
- **Procurement and Tendering (Government Portals):** 10/32% no don't use, 11/35% no too much paperwork/too complicated, 4/13% yes but haven't won any tenders, 6/19% yes in past – waste of time/work goes to larger companies
- **Apprenticeships:** 2/6% have an apprentice, 19/61% do not have an apprentice, 10/32% have had an apprentice in the past. 15/48% would be interested in a shared apprentice if such a scheme were available
- **Workforce Information:** Of the 31 businesses interviewed, 1 business had a Business Partner and a cross all businesses there was a total of 15 Employees, 2 Apprentices and 2 School Trainees.
- **Energy Efficiency Measures:** 12/39% had installed energy efficient measures in the last 2 years. Collectively, this amounted to 2,474 EE installation measures (insulation, windows and doors, ventilation, heating, electricity) with an estimated value of £5,065,000

Chart 3: Number of Energy Efficient Installations and Value



From the interview round the project gathered a list of 108 active contact numbers for Tweeddale trades people. Of those, 67 are on Whatsapp, 21 prefer email and 20 mobiles only. The project kept in touch with all on whatsapp, attempted to phone the 20 not on whatsapp and sent emails to 21 on industry news, project updates, training opportunities and webinars.

### A.3 Training, Accreditation Pathways, Funding and Webinars

#### Training

After the interview round a list of training requirements were compiled from the survey responses and circulated to 108 active contacts in August 2020 to determine wider interest for each technology course or workshop. 21(19%) businesses expressed interest (13/12% businesses were interested in multiple courses) in upskilling themselves or their employees.

Table 2: General Training Interest

Training Type	Number Interested	Training Type	Number Interested
Insulation Workshop	10	Electric Boilers	1
EPC Workshop	10	Heating Controls	1
Air Source	10	Storage and Panel Heaters	1
Ground Source	10	Calculating Energy Savings	3
Solar Thermal	8	Spray Insulation	1
Mechanical Heat Recovery	8	Building Wraps	1
Electric Car Charging	8	Ventilation	1
Solar Photovoltaic	1	Biomass	1
STEM Hub Visit	37		

Data from the survey was shared with a range of educational providers (Borders College, national training bodies and private individuals) to organise a programme of 18 energy efficiency accredited training courses, local workshops, site visits and information sessions.

The workshops, information sessions and site visits which included visits to energy efficient buildings in Tweeddale, passive house principles and planet friendly insulation technologies were programmed from November 2020 to March 2021 and February to March 2021, both programmes had to be cancelled due to Covid 19 restrictions and lockdowns.

#### Accreditation Pathways and Funding

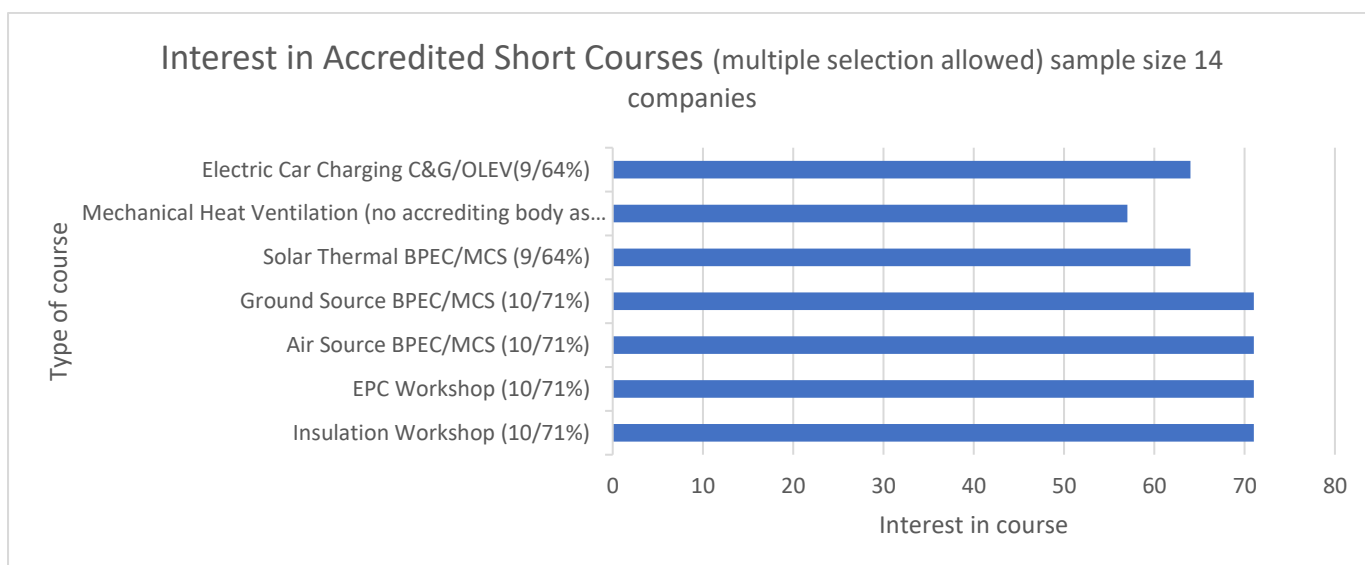
It was important that where possible, renewable courses would lead to industry recognised certification and accreditation to ensure that tradespeople were in a position to undertake works through any approved renewables grant or loan scheme. A number of accreditation schemes were investigated including Microgeneration Certification

Scheme (MCS), Office for Low Emission Vehicles (OLEV) and Trustmark (guidance from SG, Trustmark unlikely to be recognised scheme in Scotland) to verify compliance pathways.

Funding sources were also examined to assist local businesses with training course costs (there is no funding available for accreditation and associated insurance costs which can be prohibitive for small business). The project explored a number of schemes finding only two of relevance to local business: Construction Industry Training Board (CITB) and Individual Learning Accounts (ILA). Unfortunately, the majority of businesses were not eligible for either scheme as just 2 were registered with CITB and all had income levels above the threshold for ILA assistance.

The project worked closely with Borders College to arrange 5 accredited training opportunities and 2 short courses that would lead to industry certification where applicable (MCS, OLEV). The list of certified (BPEC/C&G) courses were offered to the project contact list with 14 (13%) companies expressing an interest for themselves and their employees (see chart 3: Interest in Certified Short Courses) to undertake training. Borders College were unable to deliver any of the planned courses due to Covid 19 restrictions.

Chart 3: Interest in Certified Short Courses



## Webinars

In an effort to keep people engaged with the project and deliver some of the training people had requested the project moved online. A series of 6 free webinars were aired from October 2020 to March 2021 through the online Zoom platform. Recorded content was subsequently transferred to YouTube and Facebook for catchup viewing.

A range of speakers from Historic Environment Scotland, Borders College, Skills Development Scotland, Construction Industry Training Board, Energy Skills Partnership, PAUL Heat Recovery, SURE Insulation and Ranald Boydell Architect provided a range of content which included: Retrofitting Traditional Buildings, Understanding Energy Performance Certificates, Local Demand for Renewable Energy Systems, Practical Guide to Retrofitting, Airtightness and Heat Recovery, Funding, Training and Apprenticeship Information for Businesses.

All training opportunities (see Chart 3) and webinars were promoted through Whatsapp messages, emails, SMS, local press releases, project flier (500 distributed to 16 trade suppliers in Tweedbank, Galashiels and Penicuik) and the projects Facebook page.

Web based activity does not appear to engage the sector as a whole (not used to technology, reluctance to appear on camera, uncomfortable with virtual group experience) which was reflected by low attendance (49 attendees)

overall). Whereas catch-up viewing of the webinars has continued long beyond the broadcast date with 149 views at project end.

#### **A.4 Direct Messaging, Social Media, Press, Fliers and Web**

The project engaged with and provided regular information to Tweeddale supply chain businesses as follows:

##### **Direct Messaging**

1300+ Whatsapp messages

750+ emails

1100+ Phone calls

150+ SMS

50+ Direct Social Media Messaging

Total contact attempts: 3,350

##### **Social Media**

Tweeddale Energy Efficiency Supply Chain Project page went live to Facebook on 25<sup>th</sup> September 2020. At 31<sup>st</sup> March 2021 the page has 30 followers, 26 page likes and is a member of 3 local energy efficiency and resident/business groups in Tweeddale.

Page information:

38 posts (project news, funding streams, links to energy saving pages, events)

Combined post reach 3.7K at project end (3.3K of which were between January and March 2021)

##### **Zoom Webinars**

6 online training events were recorded, edited and shared online between November and March 2021 (49 participants)

##### **YouTube**

YouTube channel set up 1<sup>st</sup> November 2020. 6 videos were uploaded between November 2020 and March 2021. Each video +/- 30 minutes

Total views to project end 149 which are broken down as follows:

##### **Webinar subject, publishing date and views**

March 2021: Funding, Training and Apprenticeships 10 views

February 2021: Practical guide to retrofitting 14 views

February 2021: Integrating renewable energy into buildings 17 views

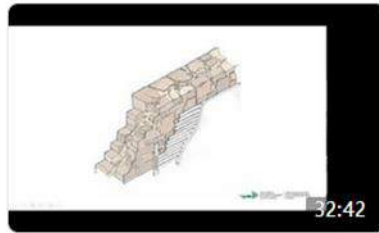
February 2021: Heat recovery and airtightness 18 views

November 2020: Understanding energy performance certificates 28 views

Screen Shots of Webinar Videos



Funding, Training and Apprenticeship Information for Construction and...



Retrofitting Traditional Buildings, Roger Curtis, Historic Environment...



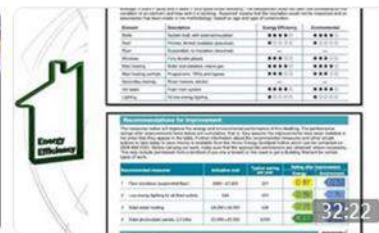
A Practical Guide to Retrofitting, Andy Walker, SURE Insulation



Integrating Renewable Energy into Buildings, Ranald Boydell



Air Tightness and Heat Recovery, PAUL Heat Recovery



Understanding Energy Performance Certificates, Borders College

Fliers

950 distributed in two rounds to 16 trade suppliers in Tweedbank, Galashiels and Penicuik as follows:

Tweedbank: Plumbstore, Plumbase, Edmundson Electrical

Galashiels: Wolseley, Howdens Joinery, MKM Building Supplies, Grahams, Dove, City Heating Spares, City Plumbing, City Electrical Factors, Jewsons, Rexel Electrical

Penicuik: Beatsons, Howdens and Grahams

Project Fliers

**insulation**

**What?** • Roof: loft, attic, eaves or flat roofs  
• Wall: internal, external & cavity • Floor: above or below structure  
• Pipes and tanks for heating hot water systems  
**Why?** • keeps the heat inside in winter, outside in summer, so reduces energy demand for heating hot water  
**Where?** • all existing buildings, whether starting from scratch or top-up of existing insulation  
• building being refurbished generally  
• building being extended, where all insulation will be included in energy calculations for building warrant  
• anytime funds are available for individual tasks

**What?** • Windows: double or triple glazed  
• Doors: insulated external doors • Secondary glazing  
• Blinds, shutters and draught devices  
**Why?** • improves both insulation and air tightness  
• well functioning windows are important for daylighting, solar heat gain, and natural ventilation  
• shading devices and blinds help prevent overheating in modern units require less ongoing maintenance  
**Where?** • all existing buildings, especially pre-1990's  
**What?** • existing windows/doors broken or near end of life  
• building being refurbished generally  
• anytime funds are available for individual tasks

**ventilation**

**What?** • Mechanical ventilation with/without heat recovery  
• Trickle vents and other natural ventilation controls  
• Improving air tightness of building fabric  
• Draught proofing windows, doors, electrical and other penetrations  
• Creation of air locks with cubicles or porches  
**Why?** • making buildings more airtight keeps the heat inside so reduces energy demand for heating  
**What?** • all existing buildings  
• airtight buildings are more at risk of damp/mould quality issues so adequate ventilation is essential • makes a home more comfortable and healthier  
**Where?** • must be considered if insulation and/or airtightness is being improved  
• building being refurbished generally  
• some tasks can even be done during renovation  
• anytime funds are available for individual tasks, especially draught proofing which is inexpensive

**heating**

**What?** • High efficiency gas/oil boilers to replace old ones  
• central heating instead of room heaters/radiators  
• heat pumps whether air, ground or water source  
• biomass boilers and high efficiency wood stoves  
• high efficiency electric storage heaters  
• controls and fittings for central heating/hot water  
• solar thermal hot water or air pre-heat  
• waste water heat recovery  
• district heating systems  
**Why?** • higher efficiency meaning lower energy bills  
• reduce carbon emissions  
**Where?** • all buildings, existing or new  
• remote/off grid locations have particular benefits  
• building being refurbished generally  
• building being extended and old systems fixed  
• anytime funds are available for individual tasks  
• larger amount of funds available for an investment  
• as part of new building construction

**electricity**

**What?** • Solar PV panels  
• wind turbines  
• battery storage  
• low energy light fittings and appliances  
**Why?** • generate electricity  
• higher efficiency equals lower energy bills  
• reduce carbon emissions  
**Where?** • all buildings, existing or new  
• remote/off grid locations have particular benefits  
• anytime funds are available for individual tasks  
• larger amount of funds available for an investment  
• as part of new building construction  
• light energy/appliances during redecoration

**TWEEDDALE ENERGY EFFICIENCY SUPPLY CHAIN PROJECT**

As more energy efficiency measures and government guidelines on carbon reduction come into force, the way you currently work may need to change.

This may mean that you will require additional training or certification to undertake some types of work. The indications are that demand for this type of work is going to grow significantly and there are real opportunities for local businesses in:

- Insulation of all types
- Draught-proofing and air-tightness
- Double/triple and secondary glazing
- Ventilation and heat-recovery
- High-efficiency gas boilers
- Biomass boilers
- District heating systems
- Heat pumps (ground, air or water source)
- Heating controls/thermostats
- Solar PV and battery storage
- Solar thermal hot water
- Low energy appliances and lighting

The Energy Efficiency Supply Chain Project has been set up to discover how best to help and assist you (as individuals or collectively) to make more of the opportunities that the transition into energy efficiency will offer. We want to support local trades to work locally and to benefit from the opportunities that energy efficiency will bring. Plans are underway to offer a range of free and subsidised training courses, workshops, information sessions and site visits from February 2021 for Trades People to include: Retrofitting Traditional Buildings, Whole House Assessments, Passive House, Insulation and Understanding EPC's Workshops, Site Visits to Energy Efficient Buildings in Tweeddale, Industry recognised (BPEC) courses in Electric Vehicle Charging, Solar Thermal, Ground and Air Source and Mechanical Heat Recovery and visits to the new STEM (Science, Technology, Engineering and Mathematics) Hub in Hawick.

In the meantime we are offering free online sessions as follows:

**WEDNESDAY 21 OCTOBER 7.00pm.**  
Retrofitting traditional building for Energy Efficiency, by Roger Curtis, Technical Research Manager for Historic Environment Scotland. The presentation will be broadcast on Zoom and will be followed by a question and answer session. Please contact Julie for the meeting link or go to our Facebook page and request code.

**WEDNESDAY 18 NOVEMBER 7.00pm.**  
Local demand for renewable energy systems, by Ronald Boydell, architecture and sustainable development consultant. The presentation will be broadcast on Zoom and will be followed by a question and answer session. Please contact Julie for the meeting link or go to our Facebook page and request code.

To find out about any of the initiatives on offer please call: **Julie Nock, Southern Uplands Partnership** Whinney House 07784 403379 or email julien@sup.org.uk. <https://www.facebook.com/TweeddaleEnergyEfficiency>  
This Scottish Borders Council project has been funded through the new enterprise agency SoSE (South of Scotland Enterprise)

## Press Releases

3 press releases were sent to all local publications between August and November 2020 (Peeblesshire News, Southern Reporter, Border Telegraph, Peebles Life)

## A.5 Tweeddale Energy Efficiency Supply Chain Questionnaire

### Tweeddale Energy Services Supply Chain Project

This pilot project aims to support local construction sector businesses to access opportunities in the energy efficiency and renewable energy market, a key element of the Scottish Government Climate Change Plan to achieve net zero carbon by 2045. The project is funded by the South of Scotland Economic Partnership (now South of Scotland Enterprise) and is being delivered by Scottish Borders Council and Southern Uplands Partnership Services Limited. The Government has set very ambitious targets to reduce greenhouse gas emissions. This will require all buildings (homes and businesses) to become much more energy efficient so that less heat is wasted. Greater energy efficiency will also reduce the cost of heating buildings and this will particularly benefit those who currently struggle to afford to heat their homes. The greatest energy savings will come from installing insulation (roof, floor or wall), double-glazing windows, upgrading boilers or simply dealing with drafts. We have been asked to work with local businesses and organisations to better understand any barriers to this work being done by local trades and to maximise the number of properties coming forward for improvement in the next few years.

**List of question topics to discuss:** General Business, Certification and Training, Energy Efficiency Projects, Energy Performance Certificates, Tenders and Procurement, Network, Case Studies, Homeowners

#### GENERAL BUSINESS

1. What type of business? Sole Trader, Micro, etc.,?
2. Main areas of work – building, joinery, etc., mixture of trades?
3. Do you employ any members of staff? If so what are their roles in the company?
4. Do you employ any sub-contractors?
5. Do you have any apprentices? What trade (s)?

#### CERTIFICATION AND TRAINING



6. Which tickets/qualifications do you (and your staff) hold? Have you (or your staff) undertaken any training in energy efficiency or new energy efficient products (full or part time)? Or are you certified installers under any schemes?

*Once tradesmen have that base level of qualification they can register with their industry association: Plumbers CIPHE, the Chartered Institute of Plumbing and Heating Engineering or SNIPEF, the Scotland and Northern Ireland Plumbing Employers Federation. Electricians SELECT, formerly the Scottish Electrical Contractors Association. There are various certification bodies for the different trades of which the NICEIC is one of the most widely recognised. Other organisations provide enhanced consumer protection. The Renewable Energy Consumer Code (RECC) is probably the largest such body in the UK but others include HIES and GGF. The Microgeneration Certification Scheme (MCS) was established by Ofgem to manage the Feed-in-Tariff scheme (FITs) for electrical microgeneration (solar, wind, hydro) but with the end of FITs in 2019 the MCS has recently become an independent not-for-profit organisation, now operating much like the other trade associations.*

7. Are you accredited with / a member of any industry bodies? If so, which...

8. If not, why not? What are the barriers (cost, time, don't see how it could assist/support, etc.,)?

9. Would you be interested in joining any professional bodies or accreditation schemes to enhance your business offering in energy efficiency? If so, which?

10. Would you be interested in attending local training sessions for you or your staff to increase your knowledge of energy efficiency/new products? If so, which days/times would work best for your business? How many people would you like to include?

11. Do you work with other industry professionals on joint contracts? List types and number...

12. If not, what are the issues around this?

13. Would you be interested in working with other local suppliers/contractors?

#### ENERGY EFFICIENCY PROJECTS

14. Do you have experience of working on any energy efficiency projects for private households or businesses in the Tweeddale area? *Send out prior to meeting as this will take some time to get through.*

#### INSULATION

(1) loft insulation, including top-up loft insulation

(2) flat roof insulation

(3) room in the roof insulation

(4) rafter insulation

(5) cavity wall insulation

(6) solid wall insulation

(7) floor insulation, including insulation beneath suspended timber floor and insulation on top of solid floors

(8) party wall insulation

(9) dynamic insulation

#### WINDOWS & DOORS

(10) double glazing

(11) secondary glazing

(12) triple glazing

(13) solar blinds, shutters and shading devices

(14) insulated external doors

## VENTILATION & DRAUGHT PROOFING

- (16) draught proofing of windows, doors and loft hatch
- (17) baffles or dampers to block open chimneys when not in use
- (18) solar air positive input ventilation

### # Mechanical ventilation systems

## HEATING & HOT WATER

- (15) hot water cylinder insulation jackets
- (19) a condensing boiler as a replacement for an existing gas, oil or liquid petroleum gas central heating boiler
- (20) a new gas central heating system (where none before)
- (21) a new oil or liquid petroleum gas central heating system (where none before)
- (22) a biomass central heating system
- (23) fan-assisted electric storage heaters
- (24) high heat retention electric storage heaters
- (25) an electric thermal store wet central heating system
- (26) air source heat pumps (both air-to-water and air-to-air systems)
- (27) ground source heat pumps
- # water source heat pumps
- (28) replacing the secondary heating with a more efficient / appropriate appliance
- (29) micro combined heat and power
- (30) fitting central heating controls including room thermostats, programmers, and thermostatic radiator valves
- (31) fitting a cylinder thermostat on the hot water cylinder
- (32) solar thermal hot water

### # Mechanical Heat Recovery Ventilation

### # Waste Water Heat Recovery

## ELECTRICITY

- (33) photovoltaic panels
- (34) solar assisted heat pumps
- (35) low energy lighting

15. If so, how many and what type, what value (cavity wall, underfloor, glazing, external cladding, boiler, renewables etc.)?

Energy efficiency measure from list above:	Type	How many	Approx value
1.insulation			
2. window/door			
3.ventilation/draught proofing			

4.heating/hot water

5.electricity

16. How many projects of this nature have you completed in the last two years (in Tweeddale and out with)?

Number	Tweeddale	Out with
0		
5-6		
6-20		
20-40		

17. If you have not undertaken this sort of work before – would you be interested in expanding into this market?

18. What would help you do this? Investment/ Training/ Additional staff/ Proof of Market /Other?

19. If funding through loans, grants or incentives were made available to homeowners to improve energy efficiency would this change your outlook on expanding into this market?

20. If you have been working on energy efficiency outside the Tweeddale area what was the reason and would you be interested in developing your business closer to home?

21. What are the barriers/challenges to expanding your business in the Tweeddale area? For instance, enhanced health and safety procedures and requirements for larger contracts, issues with tendering for larger projects?

22. Are you aware of the CWiP project that has been running?

#### ENERGY PERFORMANCE CERTIFICATES (EPC)

23. Do you understand EPC ratings and how the type of work you undertake may make a positive impact on the EPC rating of a property?

24. Is so, do you use EPC ratings as a sales tool?

25. If not, would you be interested in finding out how this information may help you to technically assess and integrate a range of measures into properties, provide guidance to property owners and increase the number of energy efficiency contracts you undertake?

26. Have you worked on any projects in the past where the reason a client requested the work was because they had received grants/loans/incentives? If so, which type of schemes/technologies were these for?

27. Are you aware of the climate change act and its implications for buildings?

#### TENDERS/PROCUREMENT

28. Do you use the government portal or other procurement sites to tender for larger contracts? Which system have you used?

29. If so, have you been successful?

30. Or why do you think you were or were not successful?

31. If you have not used online procurement systems, what are the barriers for you as a small business in accessing this type of contract (resources, administration and documentation, marketing, health and safety, etc.)?

32. Have you sought any help with these issues from outside organisations i.e. Business Gateway?

33. Yes - How was the support?

34. No – Would you be interested in specific support to assist you through these barriers? Or access other forms of business assistance? List areas (social media, planning, expansion, new markets, etc.,)

#### NETWORK

35. We are looking at the possibility of setting up a Tweeddale Energy Efficiency Business Network. Would you be interested in joining such a scheme? What would you hope to get out of such a network?
36. Yes – ask if they can recommend others to the scheme.
37. If not, why not (barriers – time, etc.,)?
38. We would like to schedule these meetings on a regular basis, with the suggestion being every month or two, possibly in the evening (or a whatsapp group to start with given C19 restrictions).
39. Which days/times are most suitable for you?

#### CASE STUDIES

40. We are keen to capture some positive success stories around energy efficiency projects in Tweeddale. Do you have any projects which we could potentially use as case studies and/or site visits?

#### HOMEOWNERS

41. What do you feel are the barriers to customers/home owners undertaking energy efficiency improvements? (They will hopefully have a sense, when talking to clients, of the number of people who are considering works and why they don't follow this up – finance, too awkward – and of others who don't feel that it is important

## B.1 Renewable Energy Installations Data Analysis

### 1. Introduction

#### Project Background

This report was prepared as part of the Tweeddale Energy Efficiency Supply Chain Development Project, undertaken by Southern Upland Partnership (SUP) for Scottish Borders Council (SBC) with funding from the South of Scotland Enterprise (SOSE). The objective of the project is to increase the uptake by local contractors of energy efficiency (EE) activities in their business, which includes the need for additional training and marketing etc. in order to help meet UK and Scottish net zero carbon target to mitigate the impacts of climate change.

Whilst the project is specific to the Tweeddale area, the analysis has also looked at the Borders area more broadly.

#### Small Scale Renewables

Alongside energy reduction measures such as insulation, small scale renewable energy is a key part of implementing energy efficiency on buildings. These are generally defined as <50kw in capacity, and are typically owned and operated by homeowners, small businesses and community organisations. Hence, they are suitable projects for local contractors to design and install.

The data was provided by MCS, who are the main UK organisation responsible for registering small scale renewable. They provided basic data for almost 78,000 small scale renewable energy systems, which covers all those registered in Scotland since January 2012. Systems have to be registered with MCS in order to receive grant funding under the Smart Export Guarantee (SEG), the Renewable Heat Incentive (RHI), or the now redundant Feed-in-Tariff (FIT) for electricity (closed in March 2019). Hence, whilst the data will not include all installations (especially not any solar PV or wind turbines installed since March 2019), it can be assumed this represents the vast majority of installations currently operating.

These systems are mostly linked to specific buildings or building groups, and the MCS data does not include large commercial installations. Scotland has a substantial number of commercial renewable energy sites, especially wind farms and hydro-electric schemes. In the context of the net zero carbon target, these commercial installations have much greater generation capacity and will provide significantly greater carbon savings by comparison.

### 2. Installations

We have considered the data for the Tweeddale area (based on postcodes) relative to the Scottish Borders region and to Scotland as a whole.

**Table 2.1 Total Installations**

	<b>Tweeddale</b>	<b>Borders</b>	<b>Scotland</b>
<b>Number installed</b>	654	3,615	77,992
<b>Total Capacity</b>	5,914 kw	27,476 kw	472,747 kw
<b>Average Capacity</b>	9.04 kw	7.60 kw	6.06 kw
<b>CO2e saved/year *</b>	2,419 t	10,441 t	168,570 t

\* CO2e calculations based on UK government and industry data.

When considered relative to population, the average figures for Tweeddale are significantly higher than for Scotland, and comparable or better than the Borders region generally.

**Table 2.2 Installations on a Population basis**

	<b>Tweeddale</b>	<b>Borders</b>	<b>Scotland</b>
<b>Population</b>	21,215	115,270	5,455,000
<b>% Scotland</b>	0.4%	2.1%	-
<b>Number installed</b>	654	3,615	77,992
<b>% Scotland</b>	0.8%	4.6%	-
<b>x Scotland</b>	2.0 x	2.2 x	-
<b>Total Capacity</b>	5,914 kw	27,476 kw	472,747 kw
<b>% Scotland</b>	1.25%	5.81%	-
<b>x Scotland</b>	3.1 x	2.7 x	-
<b>Average Capacity</b>	9.04 kw	7.60 kw	6.06 kw
<b>% Scotland</b>	+49%	+25%	-
<b>x Scotland</b>	1.5 x	1.2 x	-
<b>CO2e saved/year</b>	1,556 t	10,441 t	116,280 t
<b>Per person</b>	114 kg	91kgt	31 kg
<b>x Scotland</b>	3.6 x	2.9 x	-

So we can say:

- The Borders has roughly double the number of installations and triple the total generation capacity on a per person basis relative to Scotland as a whole.
- The average system size in the borders is 20% bigger than the Scottish average, and in Tweeddale it is almost 50% bigger.
- The carbon saving per person living in Tweeddale is more than 3½ times (3.6 x) the Scottish average, and for the Borders almost 3 times (2.9 x).

This suggests that the uptake of small scale renewable energy systems has been significantly better in the Borders and Tweeddale than the Scottish average, which is encouraging in terms of where the industry is at locally and how it can develop as we progress towards the net zero carbon target.

### 3. Technologies

The uptake does vary across the different technologies.

**Table 3.1 Installations by Type**

	Tweeddale		Borders		Scotland	
	number	capacity kw	number	capacity kw	number	capacity kw
Air Source Heat Pump	114	1,101	474	4,218	12,379	117,909
Ground/Water Heat Pump	20	220	84	1,067	1,418	17,807
Biomass	93	2,720	353	10,392	4,335	111,749
Solar PV	405	1,777	2,606	11,384	57,656	213,381
Solar Thermal	18	42	81	241	1,517	5,474
Wind Turbines	4	54	17	174	668	6,395
<b>Total</b>	<b>654</b>	<b>5,914 kw</b>	<b>3,615</b>	<b>27,476</b>	<b>77,992</b>	<b>472,747</b>

**Table 3.2 Installations by Population**

	Tweeddale		Borders		Scotland
	per 1000	x Scot	per 1000	x Scot	per 1000
Air Source Heat Pump	5.4	2.3 x	4.1	1.8 x	2.3
Ground/Water Heat Pump	0.9	3.0 x	0.7	2.3 x	0.3
Biomass	4.4	5.5 x	3.1	3.9 x	0.8
Solar PV	19.1	1.8 x	22.6	2.1 x	10.6
Solar Thermal	0.8	2.7 x	0.7	2.3 x	0.3
Wind Turbines	0.2	2.0 x	0.1	1.0 x	0.1
<b>Total</b>	<b>30.8</b>	<b>2.2 x</b>	<b>31.4</b>	<b>2.2 x</b>	<b>14.3</b>

From this it can be seen that:

- Biomass is the big winner, where the number of systems in Tweeddale is 5½ times the Scottish average and the systems are 13.5% larger capacity. The Borders has close to 4 times the Scottish average.
- Ground Source Heat Pumps are also a winner, with the proportion of systems in Tweeddale being 3 times the Scottish average, whilst the Borders has about 2.3 times the average.
- Solar Thermal is also 2-3 times the Scottish average, although at only 2% of the total they are a small segment of the market.
- Solar PV has by far the largest number of installations overall with about ¾ of the total across Scotland as a whole. There are roughly twice the number of solar PV installations locally as the Scottish average: Borders 22.6 per thousand, Tweeddale 19.1 per thousand.
- Air Source Heat Pumps numbers are also twice the Scottish average, but comparable in terms of capacity.
- Wind turbine are less than 1% of the total, and whilst this is a small segment of the market they are also otherwise comparable.

## 4. Carbon

In terms of carbon savings not all technologies are equal. Solar PV and Wind turbines offset mains electricity, but as the grid decarbonises their relative carbon benefits decrease, and once the grid is at net-zero there will be no carbon benefit to small scale renewables.

In contrast, renewable heat will be directly offsetting fossil fuels: mains-gas, bottled-gas, oil or even coal; or sometimes electric heating. Carbon emissions for these fuels range from 0.23 to 0.43 kgCO<sub>2</sub>e per kwh of heat generated.

Estimating carbon savings needs to allow for other factors. Heat Pumps consume a significant amount of electricity to operate, with a coefficient of performance of 3-4 times the energy input. Generation for all systems is also affected by “load factors”, which is the percentage of time they actually operate. Wind turbines have the highest load factor with an average of 26%. Other technologies are lower, ranging from solar PV at 11% to GSHP at 17%.

**Table 4.1 Carbon Emission Savings by Type**

CO <sub>2</sub> e * <sup>1</sup>	Tweeddale	Borders	Scotland
Air Source Heat Pump* <sup>2</sup>	432 t	1,654 t	46,247 t
Ground/Water Heat Pump* <sup>3</sup>	124 t	601 t	10,031 t
Biomass * <sup>4</sup>	1,412 t	5,394 t	58,001 t
Solar PV	410 t	2,627 t	49,244 t
Solar Thermal	12 t	70 t	1,598 t
Wind Turbines	29 t	94 t	3,448 t
<b>Total</b>	<b>2,419 t</b>	<b>10,441 t</b>	<b>*<sup>5</sup> 168,570 t</b>

\*<sup>1</sup> CO<sub>2</sub>e calculations based on UK government and industry data

\*<sup>2</sup> ASHP assumed to offset gas

\*<sup>3</sup> G/WSHP assumed to offset oil

\*<sup>4</sup> Biomass assumed to offset oil, biomass figure is based on enough trees being planted to compensate for the fuel consumed

\*<sup>5</sup> Scotland total includes Exhaust Air and Micro CHP but these are not separately listed as each is less than 0.01% of the total and they are not represented in the Borders.

So we can say that:

- Biomass is by far the biggest contributor to carbon savings in the Borders and Tweeddale with more than half the total.
- Biomass is also the highest for Scotland overall, but with Solar PV and ASHP’s providing comparable savings.



All of which is encouraging, except that in the context of the net-zero target it is just a drop in the ocean.

**Table 4.2 Carbon Emission Savings per person**

CO2e *	Tweeddale	Borders	Scotland
<b>Total</b>	2,419 t	10,441 t	116,280 t
<b>Population</b>	21,215	115,270	5,455,000
<b>kg per person</b>	114 kg	91 kg	31 kg

The UK average carbon emissions per person is 5,645 kg, so the Tweeddale average of 114 kg per person is 2% of that, and the Borders average of 91kg just 1.6%.

That figure of 5,645 kg covers each person’s “share” of all UK emissions, including transport, industrial and agricultural emissions, most of which we have no direct control over. However we do have control over the emissions related to our household.

If we assume each installation is linked to one household, with the average capacity of 9 kw (see table 2.1 above), the estimated carbon saving per household in the Borders would be 2,888 kg, in Tweeddale 3,699 kg. The average household size is 2.4 people, so that would be 21% or 27% of their “share”.

To get a sense of scale, most household Solar PV arrays are only 4kw, which is the maximum permissible for a standard connection. An array of 9 kw would require about 30 panels covering 50 sqm, which would take up pretty much all of the useable roof area on a typical detached house and require a 3-phase electricity connection.

In other words, the average small scale renewable system in the Borders can save about a quarter of a household’s carbon emissions, which is a significant amount but still a long way from net zero, and getting to net-zero will not be possible on the typical house with renewable alone.

## 5. Conclusion

From analysis of the data we can conclude:

- a. Uptake of small scale (<50kw) renewable energy systems in the Borders and Tweeddale is significantly greater on a population basis than the Scottish average, with double or triple the result in terms of both number and capacity.
- b. Some technologies have done better than others, with Biomass and Ground Source Heat Pumps being the obvious “winners” in the Borders. Solar PV has by far the biggest number of

systems overall, but all technologies are represented and all should be considered for future potential.

- c. It could be assumed these outcomes are due to the rural nature of the region, with more land available for installations, a ready supply of timber for biomass fuel, and more buildings which do not have access to mains gas for heating.
- d. Whilst we cannot tell what proportion of the installations was done by local contractors, it is reasonable to assume many of them would have been, and this suggests the local industry does have a good awareness and experience with renewable energy as part of EE works.
- e. Importantly, it also indicates that local demand is significantly greater than the Scottish average in terms of both numbers and capacity.
- f. This all translates to bigger carbon savings: in Tweeddale this is more than 3½ times the Scottish average, and for the Borders almost 3 times.
- g. However, the carbon savings from the installations completed represent only a very small part of the total that will be required to achieve the net zero target, and so demand for EE works generally, not just renewables, will have to increase hugely over the next 20+ years.

It is hoped these conclusions will provide very strong encouragement for local contractors to up-skill and expand their business offering for small scale renewable energy systems, confident that demand already exists in Tweeddale for systems and that this will expand significantly in the transition to net zero carbon.