Cumbria Carbon Reduction and Climate Change Programme:

Localism, Energy and Planning
A Cumbria Case Study
In the

nwIEP north west improvement and efficiency partnership | CLASP. | Cumbria Energy Associates

SEE?
Sustainable Energy Eden

Contents

Introduction

This report is the culmination of community engagement through events, questionnaires, meetings and policy analysis as it developed during the project from January to June 2011. The report itself is in 3 parts to make it more readable for those wishing to get straight to heart of "what did the people say, and what do we want to do about it?" Part 1 gives a little preamble, but then goes straight into our findings and suggested action plan. Part 2 is more concerned with the 'how', and Part 3 contains appendicles of supporting material and evidence – this is where the bulk of time was spent over the period of the project.

PART ONE: Executive Summary

Background

On behalf of the Climate Change Local Area Support Programme (CLASP) and the North West Improvement and Efficiency Programme (NWIEP), Cumbria Energy Associates (CEA) were asked to deliver part of the Cumbria Carbon Reduction and Climate Change Programme in the Heart of Eden.

The case for carbon reduction is now well established and is being driven by National and International policies which expect, at the very least, a 20% reduction in carbon emissions by 2020. Halfway through 2011 there seems to be insufficient momentum to achieve this target. There is an additional imperative which is driving the agenda: the need to enhance our energy security on a national basis and mitigate the effects of potentially massive hikes in energy prices on a local basis, though the deployment of distributed renewable energy schemes which primarily benefit local residents, communities and businesses. At the time of finishing this report, we've had the major energy companies announcing their price rises for this year. I remember at our first workshop talking about the possible scenario of up to 25% increases, and whilst that may have been seen as scare-mongering, it looks like the old soothsayer was right!

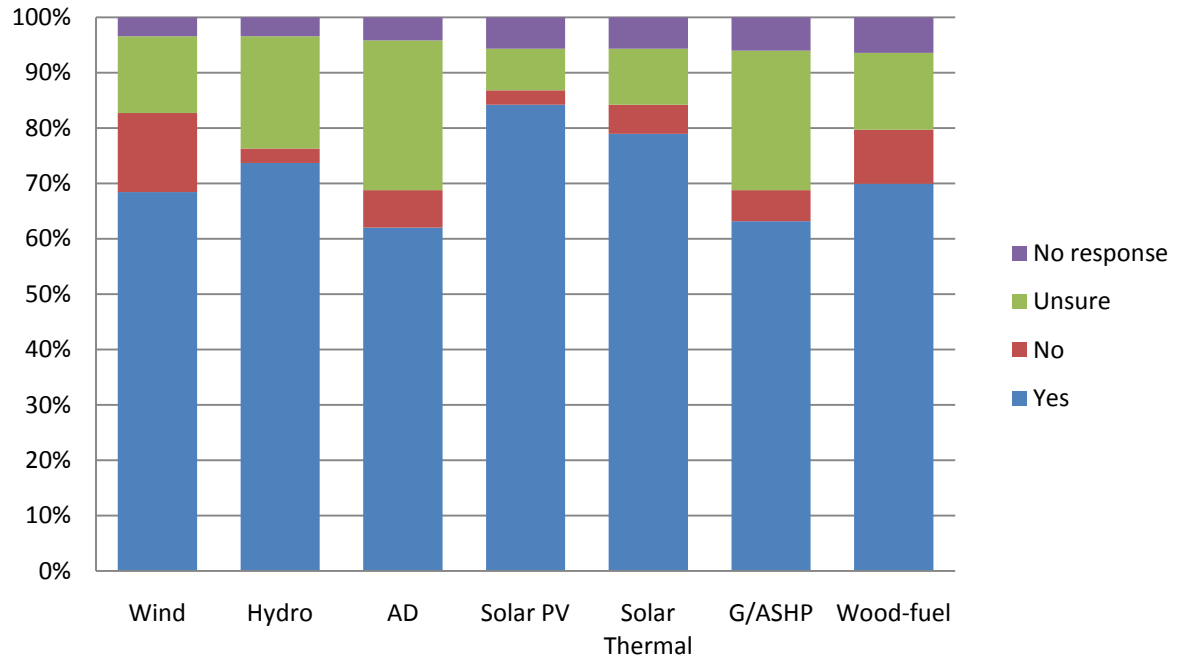
This 5 month project was commissioned to examine opinions of the small rural communities in the Heart of Eden (HOE: see www.heartofeden.co.uk) and then raise awareness of local opportunities. It specifically set out to deliver a final report that would strongly identify and recommend a series of clearly prioritised Actions which would fit within Local and National policies and could also propel the Heart of Eden into being a Renewables exemplar.

In addition to the clear, moral imperative to develop an active Renewables Strategy, this report recognises the extensive financial rewards that the current Feed In Tariffs (FITs) and planned Renewable Heat Incentive (RHI) can offer home owners, businesses and communities.

Questionnaire Summary

Over 270 completed questionnaires were returned and they all show an overwhelming support for renewables. The following chart over the page is a composite summary:

Overall Support for Renewable Energy Technologies



The survey shows outstanding, majority support for all types of renewables. The relatively lower support for Anaerobic Digestion (AD) was identified within the survey due to lack of knowledge, rather than lack of support. Importantly, less than 10% of the overall replies were not in favour of renewables.

It is noted towards the end of the main report that between April 2010 and June 2011 there have been about 400 renewables installations in Cumbria of which about 70 have been in the Eden District area. There is room for considerably more, for example in the small village of Bolton alone there are currently 8 Solar Photovoltaic installations and plans for another 6.

Action Plan Highlights

It was always anticipated that this project should be action oriented and lead towards a series of achievable measures which would make a difference. In this case, we are looking at ways to accelerate deployment of renewable energy schemes which would benefit businesses and residents in the Heart of Eden, and demonstrating that Eden is taking a leading role for Cumbria. This of course also has the added benefit of helping contribute greatly to carbon emission reduction and renewable energy targets.

The actions were grouped under 3 logical headings, and assigned an action number:

- Knowledge & Skills
- Planning & Funding
- SEE? Implementation

There are 14 clear actions recommended in total, but the highest priorities are as follows:

TOP PRIORITY ACTION

	Cost	Time	Impact	Deliverable	Support		
HOE IPS - create commercial entity capable of raising funds and share offers to finance scheme. Request Action for Communities within Cumbria (ACT) to investigate funding for a project.	2	3	3	3		4	GOLD
Power Utilisation Project - HOE to request financial support from an electricity generator to fund an energy meter for every 6th Former at Appleby Grammar School to carry out a 1 year project in power management.	3	2	3	3		3	
Sources of Funding - EDC / HOE to investigate Lottery Funding opportunities etc. (Envirolink no longer provide this free, and ever changing landscape).	3	3	2	3		3	

In Appendix 8, you can see the number of FIT registered installations in Eden compared to Cumbria as a whole. This shows that we're not doing badly at all and yet there is still so much potential. The statistics show that we certainly have a major opportunity with hydro, but then the environmental designation on our major river system, the Eden, (Special Area of Conservation & Site of Specific Scientific Interest) make it a complex and difficult process to satisfy the constraints that these designations impose.

Microgeneration Combined Heat & Power (CHP) boilers are also a significant opportunity which should be explored further, as there are still grants available towards the cost of purchase and installation.

It is so important that this Report and its Actions are continued within the active policies of Eden District Council and The Heart Of Eden Development Trust, so that the local communities can develop an exemplar renewables plan whilst receiving the considerable financial benefits for doing so.

In Eden, we have long used our natural resources for economic benefit and the good of our communities, we now have an opportunity to do so in ways which also will benefit and enhance the environment!

Nenthead Mine courtesy of Carl Bendelow

Simon Sjenitzer
Richard Greenwood
Cumbria Energy Associates
June, 2011

Project Overview

On behalf of the Climate Change Local Area Support Programme (CLASP) and the North West Improvement and Efficiency Programme (NWIEP), Cumbria Energy Associates (CEA) were asked to deliver part of the Cumbria Carbon Reduction and Climate Change Programme in the Heart of Eden.

Cumbria County Council led a £100,000 programme to help local planning authorities better understand and tackle the causes and effects of climate change in Cumbria. The programme was delivered in partnership with Cumbria Planning Training Scheme, Eden District Council, the Lake District National Park Authority and Arnside and Silverdale Area of Outstanding Natural Beauty.

The overall programme comprised of a training and advisory element and three action learning projects. The programme ran until June 2011 with a final presentation and report in July.

The element that concerned this project was focused on *Localism, Energy and Planning* in the Heart of Eden area which takes in the market Town of Appleby and 10 surrounding Parishes. The aim was to involve local communities as much as possible, and communicate all stages to a database collated from those who expressed interest. Seminars were also used to:

- Understand or / and explain energy demand and carbon emissions in the Heart of Eden area, broken down to a proxy Parish level.
- Explore the capacity and willingness of the locality to generate renewable energy and other measures to reduce carbon emissions: the options, carbon savings, costs and benefits.
- Make links with existing activities regarding community renewables in the Heart of Eden area.
- Explore current planning policies and considerations for various technologies in the locality.
- Explain and examine Options Appraisals and help people visualise the character of different technologies (including micro generation, community scale generation and large scale generation).
- Prioritise appropriate technologies.
- Explore different methods of financing a community owned energy scheme (using the emerging Cumbria Community Owned Renewables Fund as an example).
- Review and agreeing planning criteria – localism in the context of existing policies.
- Design a community consultation document/questionnaire.
- Provide the information for a Plan of Action for Renewable Energy and Carbon Reduction and in particular recommend ways the local planning authority can adapt criteria to help accelerate delivery.

This project directly addresses one of the Heart of Eden Community Plan's Action - *E3: Research the costs and feasibility of renewable energy schemes for villages*.

In addition, the project will seek to promote actions that can be completed within the three year timescale. The action within the Heart of Eden Community Plan was generated through the household survey that was sent to all residents in the Heart of Eden area. Residents felt that improved energy efficiency and energy self-sufficiency would be one area that would most improve their lives over the next ten years.

Action Plan Recommendations

Throughout the SEE? project, we collated ideas and proposals which were made through the questionnaire analysis process, emails addressed to the Heart of Eden web site, workshops and a series of discussions with businesses, Eden District Council officers and the Heart of Eden Development Trust.

It was always anticipated that this project should be action oriented and lead towards a series of achievable measures which would make a difference. In this case, we are looking at ways to accelerate deployment of renewable energy schemes which would benefit businesses and residents in the Heart of Eden, and demonstrating that Eden is taking a leading role for Cumbria. This of course also has the added benefit of helping contribute greatly to carbon emission reduction and renewable energy targets.

The actions were grouped under 3 logical headings, and assigned an action number:

- Knowledge & Skills
- Planning & Funding
- SEE? Implementation

The actions were subsequently discussed at the last SEE? Workshop on the 16th June, and the participants were asked to demonstrate their support by simply placing a small number of stickers on their preferred projects which had been hung up on flip chart paper around the room.

Following the workshop, each individual project was considered by the project team in terms of relative cost, timescale to achieve, the impact and ability to deliver. We used a simple traffic light scoring system which returned a **red** value if we felt that its merit was poor compared to the other actions, a **green** value if we considered relative merits to be above the average of the others, and an **amber** value if there were no particular strengths or weaknesses in comparison to others. The last column in the action table below shows a bar-line graphical indication of the level of support felt at the open workshop held on the 16th.

Whilst we acknowledge that neither of the 2 methods above stand up to a tremendous amount of rigorous scrutiny, it does offer a fair proxy and point towards the beginnings of prioritisation for actions which would be supported within our communities, which have the ability to deliver along with the biggest impact.

The final piece of analysis we did was to give the overall scoring some form of hierarchy, and then group the actions into Gold, Silver and Bronze, to clearly demonstrate how to focus for maximum impact. See table over the page for full Action List:

SEE?
Sustainable Energy Eden

FULL ACTION LIST

Action		Cost	Time	Impact	Deliverable	Support	
SI3	**HOE IPS** - create commercial entity capable of raising funds and share offers to finance scheme. Request Action for Communities within Cumbria (ACT) to investigate funding for a project.	2	3	3	3	4	GOLD
KS4	**Power Utilisation Project** - HOE to request financial support from an electricity generator to fund an energy meter for every 6th Former at Appleby Grammar School to carry out a 1 year project in power management.	3	2	3	3	3	
PF3	**Sources of Funding -** EDC / HOE to investigate Lottery Funding opportunities etc. (Envirolink no longer provide this free, and ever changing landscape).	3	3	2	3	3	
PF2	**Planning Guidance for Renewables -** EDC to develop its own in-house guidance to be "Class Leading", positive, proactive and linked with Building Control	3	2	3	3	8	SILVER
KS2	**Renewables Masterclass** - identified through analysis, the questionnaire highlighted a lack of knowledge, especially amongst young people. There is a need for better levels of understanding for all aspects of renewable energy. Young Enterprise willing to develop masterclass for students 14+.	2	2	3	3	5	
PF1	**Renewable Energy Planning Facilitation** - renewable energy and district heating planning facilitation service aimed at community groups & (much like rural planning facilitation scheme offered by CREA).	1	3	2	2	7	
KS5	**Sources of Co-ordinated Information** - Web site to host single repository of information regarding FITs, RHI, funding, case studies, contacts etc. HOE web site to host? Need to fund p/t officer ½ day per week for effective update and communication.	1	3	2	3	4	
SI1	**Greening of Eden Businesses** - energy efficiency and renewable energy advice to all businesses with the result of group procurement for solar pv & thermal panel, LED lighting etc, and possibility of income from FIT and RHI.	2	2	3	2	6	BRONZE
SI2	**Green Deal Eden** - investigate group purchasing of green energy for all residents, businesses, public sector bodies and social housing. Lead EDC?	2	2	2	3	3	
KS1	**Low Carbon Skills Provision** - need to have local MCS accreditation training capability, also linked to RHI and Green Deal. HOE to investigate RDPE funding to co-ordinate skills/training providers.	2	2	2	3	2	
KS3	**Information Literature** –. Associated with the Masterclass, schools could develop their courses to be more informative and help EDC to develop a much better leaflet for residents / businesses in association with the planning guidance.	2	2	2	3	1	
SI5	**Parish Engagement** based Renewables survey, with recommendations and cost /benefits analysis, and evening presentation for HOE. Could be privately or community funded installations.	1	2	2	3	4	
SI6	**Kirby Thore** - EDC / Kirby Thore Parish Council to investigate "Whole Village" approach to develop gas connectivity, CHP Microgeneration boilers and anaerobic digestion plant. Exemplar village.	1	2	3	2	3	
SI4	**Revenues of the Future** - an initial feasibility study for Eden District Council based on their property portfolio. Some of the Section 106 monies from Sainsbury's or Booths could be spent on investment in renewable energy installations, allowing them to reduce their energy bills and generate income to support other council projects in the community.	2	1	3	1	0	

PART TWO: Methodology

Cumbria Energy Associates

Cumbria Energy Associates (CEA) is run by 2 senior, very competent managers with extensive experience of strategic developments in Cumbria, and sustainable economic development in particular.

Simon Sjenitzer : A strong and highly credible commercial Business Development, Sales & Marketing background to Board Director level in the IT Services and Business Process Outsourcing market , and over the last 3 years leading renewable energy and carbon reduction initiatives in the economic development sector for Cumbria. As Strategy Director for Cumbria Vision led on economic development as a public agency to help the private sector invest and flourish.

Richard Greenwood : A highly influential Senior Business Leader with extensive experience as CEO or M.D. in championing strategies for growth in a range of environments including retail, manufacturing, steel processing, not for profit, community education and, more recently, in strategic regional economic development. As Chief Executive of Cumbria Vision he provided the leadership and determination to identify Energy as one of the 2 main priorities for Cumbria.

The partners were responsible for the development, agreement and publication of the first ever Economic Strategy for Cumbria (2009 - 2019) which identified as its top priority, "Energy and the opportunities of the low carbon economy".

Research

Many data sets were used to inform our analysis including the Office for National Statistics (ONS), Department of Energy and Climate Change, (DECC), Office of the Gas and the Electricity Markets (Ofgem), Cumbria Strategic Partnership and Eden District Council.

We reviewed many research papers, reports and Government policy updates during the project to ensure that we used the best available information and learnt from other research work of relevance. We would like to mention a special note of commendation for ongoing excellent work of the Forum for The Future (http://www.forumforthefuture.org/), and the Centre for Sustainable Energy (http://www.cse.org.uk/), both of whom have indirectly influenced our work.

All the statistics have some form of 'lag' as data sets can vary from 10 years old to 2 years old, and additionally they can lack granularity at parish level, so we have used our analysis to 'proxy' the information across the Heart of Eden area. However, this data research coupled with local knowledge shows clearly that the domestic usage of electricity is amongst the highest in the country[1], and household resource efficiency amongst the lowest due to the rural off gas-grid nature and age of our properties. We therefore conclude that the majority of the Heart of Eden with a population density of 0.25 per km^2, is particularly negatively impacted by rising fuel prices, and Government policy initiatives to date have had little impact in our area. It is hoped that the Green Deal and Energy Company Obligation might now combine to help hard to treat properties in rural locations.

[1] See Appendix 5: Detailed Parish Profiles

Questionnaire

Questionnaires were developed for 3 target audiences, householders, young residents and businesses within the Heart of Eden. The purpose of the questions was to engage with the community and discover what the level of knowledge and support was for renewable energy schemes of all types and sizes. We also asked whether there was intention and support to invest in such schemes, either collectively with community ownership or as individuals.

Whilst all news articles, posters and event material encouraged the forms to be completed online (www.heartofeden.co.uk) through a Survey Monkey format, we recognised that not everyone in our community is comfortable with internet use, or even has Broadband access! We therefore printed 2,200 copies of the household forms and distributed these through a combination of insertion to an edition. The Herald through Dents Newsagents, The Helm newsletter and with the kind further offer of help for hand delivery to the parish of Temple Sowerby. Copies were also available to be collected and returned to the Tourist Information Centre, The Coop, The Royal Oak and Bridge St Newsagents – we thank all the above for their kind and generous support. With an estimated 2,300 houses available to comment, the response of 6% is statistically valid and considerably more that marketers would expect from what was effectively a leaflet drop.

For young residents, we asked the Appleby Grammar School for support, and developed extra questions which gauged levels of understanding in aspects of policy and the need for carbon emissions reduction . Several classes of scientific and environmentaly related topics dedicated time to the issue and pupils were invited to complete the online study. With over 100 completed questionnaires, we have in total views from some 18% of the school.

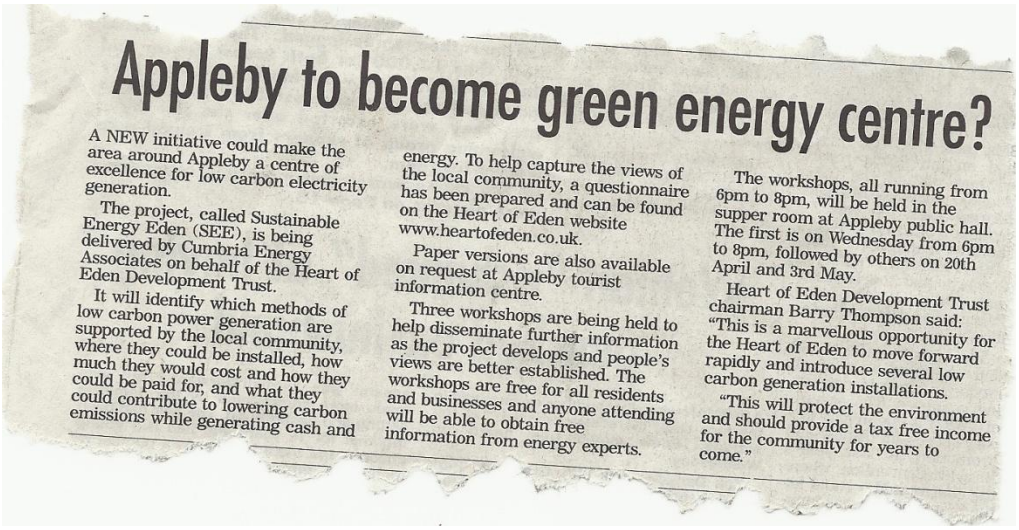
Businesses tend to be mainly concentrated in Appleby, so we took the offer for a hand drop from the Chamber of Trade. This method (unsurprisingly) proved to be the most effective, with almost 25% response.

Full results and analysis can be found in Part 3 of this report, Appendix 6 refers.

Events

3 workshops were planned to help communicate the project objectives and educate interested members of the community into 'the art of the possible' with renewable energy projects.

In addition to an article printed in the March edition of the Heart of Eden news magazine, The Herald also ran a story on their front page of the SEE? Project!



Appleby to become green energy centre?

A NEW initiative could make the area around Appleby a centre of excellence for low carbon electricity generation.

The project, called Sustainable Energy Eden (SEE), is being delivered by Cumbria Energy Associates on behalf of the Heart of Eden Development Trust.

It will identify which methods of low carbon power generation are supported by the local community, where they could be installed, how much they would cost and how they could be paid for, and what they could contribute to lowering carbon emissions while generating cash and energy. To help capture the views of the local community, a questionnaire has been prepared and can be found on the Heart of Eden website www.heartofeden.co.uk.

Paper versions are also available on request at Appleby tourist information centre.

Three workshops are being held to help disseminate further information as the project develops and people's views are better established. The workshops are free for all residents and businesses and anyone attending will be able to obtain free information from energy experts.

The workshops, all running from 6pm to 8pm, will be held in the supper room at Appleby public hall. The first is on Wednesday from 6pm to 8pm, followed by others on 20th April and 3rd May.

Heart of Eden Development Trust chairman Barry Thompson said: "This is a marvellous opportunity for the Heart of Eden to move forward rapidly and introduce several low carbon generation installations.

"This will protect the environment and should provide a tax free income for the community for years to come."

Whilst we encouraged people to register and book places beforehand allowing us to provide catering and seating plans, many turned up on the day unannounced which did challenge us somewhat on the first event, but non were turned away!

In total over 120 people attended the 3 separate workshops, through sun, wind and the inevitable rain.

Throughout the events, a database has been compiled of more than 200 people which can now be used for future related projects and will be subject to the usual Data Protection legislation.

Workshop 1, 16th March, The Supper Rooms, Appleby, 6pm – 8pm (coffee from 5:30pm).
Purpose:

To give a broad overview of the different renewable energy technologies, what they cost, how and why they contribute towards reducing carbon emissions, how much electricity they could produce and therefore reducing energy bills and generating cash for the community. Information packs were given to all attendees and it is hoped they will share the knowledge with friends and family, helping to complete the online questionnaire.

As an extra incentive, there was a **prize draw for a smart meter** -a simple to install device that instantly encourages better energy efficiency behaviour to drive down electricity bills!

Modus Operandi:
Scene setting context is seperated from the practical information of different technologies. Each numbered speaker was limited to 8 minutes talk (psycholgically it's under 10!). We then revolved delegates around each of the technology tables a – e, allowing 10 mins at each. Each of the technology experts at the tables gave a broad 'brush stroke' understanding to the delegates, as opposed to going into individual scheme interest, and also captured initial feedback, say the 3 most common points being raised.

Agenda

1. Welcome & Introduction (Barry Thompson - HoE)
2. Project Outline, purpose & parish detail (Simon Sjenitzer - CEA)
3. Climate Change Policy (Becky Willis – SDC & LDNP)
4. Planning Considerations (Roger Hopcraft - EDC)
5. Social Enterprise & Community Action (David Hollings - CMS)
6. How we are going to run the workshop (Simon Sjenitzer - CEA)
    a. Wind & Hydro (Miles Posstlethwaite – Turbine Ser.)
    b. Wood (Neville Elstone – C.Woodlands)
    c. Solar (Ewen Elstone – Love Solar)
    d. AD (Rob Skinner - CORE)
    e. G/ASHP & Solar Thermal (Karen Mitchell - Encompas)
7. Closing remarks & what happens next (Simon Sjenitzer – CEA)

Workshop 2, 20th April, The Supper Rooms, Appleby, 6pm – 8pm (coffee from 5:30pm).

Purpose:

To give some feedback from initial findings of the questionnaire, and to cover in more depth requested topics which we didn't have time to cover in workshop 1. We also used the opportunity to communicate the Heart of Eden Big Society vanguard community projects including Bongate Hydro and Bolton village hall solar panels.

Modus Operandi:

Straight forward presentations this time interspersed with video's of community case studies, but with active feedback encouraged.

Agenda

A slide of the agenda for workshop 2 is shown here.

Workshop 3, 16th June, The Supper Rooms, Appleby, 6pm – 8pm (coffee from 5:30pm).

Purpose:

This had 3 distinct purposes: to give the full questionnaire results and analysis, to present Anaerobic Digestion (AD) technology and Cumbrian activity to the local farming community, and to 'brainstorm' actions that residents would like to see happen in the area.

PART THREE: APPENDICES

APPENDIX 1: Planning Context

This section of the report is focused on the local policy context as this is of course unique to Eden. It must be emphasised however that national policy/guidance is also a significant material consideration in planning decisions, particularly where there is a policy gap at the local level or where local policies have been superseded by more up to date national documents.

There is also currently ongoing debate surrounding the status of the Regional Spatial Strategy (RSS) following its revocation earlier this year and more recent High Court judgement on this decision. At the sub-regional level, the saved policies of the Joint Structure Plan remain relevant and the Cumbria Wind energy SPD has also been adopted by Eden DC.

In addition, this overview identifies 'Renewable Energy' policies only. In reality, the planning decision making process for any renewable proposal (assuming it is not deemed permitted development) will be dependent on balancing a much wider and more complex set of considerations (and consequently policies). Any decision will be influenced by various material factors, not least the proposal's scale and location along with the nature and type of technology proposed.

Each case will therefore need to be considered on its own merits and this will often involve striking a careful balance between exploiting Cumbria's significant renewable energy resource against protecting key environmental assets and wider residential and public amenity.

There is no substitution for engaging early with the planners and developing a professional working relationship with mutual respect.

National Policy Context / Guidance

- PPS22: Renewable Energy (August 2004) – sets the Government's policies for renewable energy, which planning authorities should have regard to when preparing local development documents and when taking planning decisions.
- Planning for Renewable Energy: A Companion Guide to PPS 22 (December 2004).
- National Policy Statements (draft).

Regional Policy Context

- RSS - Regional Spatial Strategy for the North West (adopted September 2008).
  The RSS was revoked with immediate effect in July 2010, however a recent High Court judgement has concluded that this was unlawful. The status of the RSS and its policies is therefore currently uncertain.

Sub Regional Policy Context

- Cumbria and Lake District National Joint Structure Plan 2001-2016 (adopted April 2006 -saved policies only).
- Cumbria Wind Energy SPD (adopted October 2007).

Local Policy Context

- **Local Plan** Policy NR2 Wind Energy Developments has expired
- **Local Development Framework**: **Eden Core Strategy** (adopted March 2010) The Core Strategy includes the following policies:
    - CS19 – Energy Conservation, Efficiency and Production in New Developments
    - CS20 – Renewable Energy

The Policy wording is set out below:

"Policy CS19 Energy Conservation, Efficiency and Production in New Developments
Applications for new developments should seek to maximise the potential for energy conservation and efficiency and the use of low carbon energy sources. Consideration should be given to design, construction, layout, orientation, massing, internal design, materials used, insulation and heat recovery (combined heat and power) of the scheme.

With regard to the use of decentralised and renewable or low carbon energy in new developments, the thresholds and targets as set out in RSS policy EM18 will be adhered to until reducing thresholds/targets are developed in a future Primary Development Control Policies DPD."

"Policy CS20 Renewable Energy
Renewable energy proposals will be supported particularly where they contribute towards meeting and exceeding the minimum renewable energy targets set out in the RSS and where there are no significant unacceptable effects which cannot be mitigated or are not outweighed by the national and regional need for renewable energy development or the wider environmental, social and economic benefits that the scheme may bring.

Schemes need to consider impacts on the following;

- *Landscape character(particularly in and around the North Pennines AONB and the LDNP)*
- *Local amenity*
- *Habitat and species*
- *Farming and land based industries*
- *The local transport network and*
- *Connections to the electricity distribution network."*

NB – Both of the above policies make reference to the RSS and also further development of the RSS renewable energy targets. Revised targets will most likely be identified through the current Cumbria County Council Renewable Energy Study.

Future local policy context

- **Local Development Framework: Primary Development Control Policies DPD**

The Primary Development Control Policies Development Plan Document (DPD) will provide greater detail and clarity to the spatial policies within the Core Strategy. It will cover issues including the Natural Environment, Natural Resources and the Built Environment.

The most recently published Local Development Scheme advises that initial public participation (Regulation 25) in the preparation of this document will commence in January 2011. Other key milestones include publication in August 2012 leading to adoption in September 2013.

Issue: Permitted Development with Solar Photovoltaic Panels

Throughout this project it's become clear that there is a potential misunderstanding between Government policy, the public, planning authorities and their respective Building Regulation departments. There seem to be inconsistencies in the approach taken by Local Authorities as to whether Building Regulation applications are needed or not.

Director wants councils to have definitive guide on solar panel installation

THE director of a renewable energy company has called on the Government to stop councils going against laws intended to encourage solar power schemes.

Clear rules spell out how homeowners can have solar PV installed as long as the work is done by a fully-approved contractor. However, a number of councils are going against the Government's guidance by wrongly telling people they require planning permission or building regulations approval.

David Hunt, a director with Eco Environments, one of the country's leading renewable energy companies, which has an office in Penrith, said: "The Government's rules are clear. Planning permission is not required unless you live in a listed building or conservation area and building regulations are not required as long as the homeowner uses a contractor under the Government's competent person scheme. Even in a conservation area, planning should be permitted and building regulations should not be necessary as long as the homeowner notifies the local authority and uses accredited installers.

"The Government needs to make it absolutely clear to local authorities everywhere that they have a duty to adhere to these rules rather than standing in the way of progress.

"The majority of councils do comply, but a small number seem hell bent on causing as many problems as possible. By doing so, they are discouraging people from pursuing renewable energy solutions for their homes and cocking a snook at the Government's environmental agenda."

Mr. Hunt added that he had been contacted by shadow energy minister Huw Irranca-Davies who had promised to raise the matter in Parliament. The shadow energy and climate change minister, Luciana Berger, has also pledged to take the matter up with the Government, as has Rory Stewart, Conservative MP for Penrith and the Border.

Cathy Debenham, the founder of renewable energy champion You Gen, said: "Councils lost an important revenue stream when they were told they should no longer require planning permission for solar PV schemes. By trying to persuade homeowners into believing they do need permission, or at the very least building regulations approval, maybe they're attempting to cling on to some kind of ongoing income.

"What is the point of Government making laws if councils are going to ignore them? Any council which is pursuing such an agenda deserves to be held to account as their actions fly completely in the face of the Government's policy of encouraging homeowners and businesses to embrace renewable energy solutions wherever possible."

Eco Environments' campaign was triggered by reports it received from homeowners in the Eden Valley who had wrongly been told they needed to secure building regulations approval. Mr. Hunt added: "The Government should publish a simple, definitive guide for councils to follow which make it clear there is no room for local authorities to make up their own rules and regulations. Perhaps then we'll finally see a 100 per cent. consistent approach towards renewable energy schemes across the country."

Mr. Stewart, whose constituency includes the Eden Valley, said: "Something has clearly gone wrong in the correct regulating of planning laws in relation to solar panels. It is imperative that individuals, businesses and community groups are able to install PV with a minimum of fuss and regulation."

At the time of writing this report, articles on this subject have appeared locally and nationally, with Rory Stuart MP also getting involved with commentary in the press.

It remains unclear why any Building Regulations Application should be needed, when all installations qualifying for Feed-in-Tariffs need to be carried out by properly accredited personnel. Local Authorities across the country vary in opinion and claim that either no application is needed, applications are needed but anecdotally it is simply part of the process and reasonably 'rubber stamped', to the extreme where Councils are asking for additional supporting evidence from a proper structural survey costing up to £500!

The issue is causing cynical public to believe that this is just another revenue generating effort of the local authorities, and at the time of writing this report it still needs to be addressed.

LOCAL NEWS

Eden call to regulate solar panel installers

'The work 'must meet all requirements and roofs be sound'

Issue: Politics of Power!

There continues to be inconsistent messages and planning determinations which hinder deployment of renewable energy sources across Eden. This naturally leads to accusations of Nimbyism (Not in My Back Yard) or the new acronym of 'Banana' (Build Absolutely Nothing Anywhere Near Anything), and doesn't lend itself well to the Local Authority demonstrating progressive behaviour to help reduce carbon emissions or achieving renewable energy targets.

Rash of turbines fear

A FEAR of there being a "measles-like effect" of wind turbines popping up all over the district was raised as Eden planners indicated they were minded to refuse one at Ousby.

Permission to erect a 20m high turbine at Shire Lodge, Ousby, was being sought by Martin Dixon, but members of Eden Council's planning applications committee decided to reject a recommendation to approve which was before them.

Planning officer Malcolm Johnson said the grey 49ft structure measured about 60ft in total with its three blades, which should be coloured matt black as white gloss ones were highly reflective in sunlight.

A survey carried out by Ousby Parish Council had found that the majority of the villagers were opposed to the development, but the margin was reasonably small.

"The principle objections come from the visual intrusion of an alien structure in an unspoilt landscape" planners were told in a report.

Henry Sawrey-Cookson (Ind. Alliance., Kirkby Thore), who moved the motion to refuse planning consent, said the wind turbine would be very visible from the fell edge and he was surprised that the site was not an Area of Outstanding Natural Beauty (AONB). What was being proposed was not aesthetically pleasing and did not enhance the district's environment or landscape, he said.

Michael Holliday (Langwathby, Ind. Alliance) said he did not think that this was a situation where there should be a turbine "stuck in a field". Michael Slee (Askham, Con) said they could end up with a "measles-like effect of pylons all over the district".

Gwyn Clark, assistant director (planning services), said the council's policy was to give encouragement to new forms of energy production, but each application needed to be considered on its own merits. Due to the potential "adverse visual impact", the proposal will be revisited at next month's planning applications meeting.

The Localism Bill will help local communities make their own decisions with what development they want to see happening in their area, but this is thought unlikely to help some of the more controversial schemes not considered in keeping with the landscape.

We believe that one of the key elements to have emerged from our study, is that if the community get some real benefit from the scheme, they are more likely to support it. The lure of saving money on energy costs or receiving dividend payments from shares in a scheme will certainly help get buy-in.

APPENDIX 2: Legal Forms to Establish Community Groups

In order to set up a community renewables scheme, a legal body is required to take the scheme forward. This legal body needs to be incorporated so that its members can have limited liability and so that there is a body which can own property, enter into contracts and employ staff in its own name, rather than contracts, leases etc. being legally in the hands of one or more of the members as individuals.

There are several legal forms which community renewables schemes can adopt.

Companies are incorporated under the Companies Act 2006. A minimum of one member is required to form a company. The constitution of a company (the Articles of Association) can be a long and complex document. Companies are cheap and easy to register, but the regulatory paperwork required by Companies House (designed to protect the interests of shareholders) is relatively heavy. The penalties for not complying with regulations are potentially stiff.

Company law is not designed to meet the needs of social economy organisations, but it is very flexible and with effort most of their principles can be built-in. For example, there is a statutory right to proxy votes at members' meetings, which means that a member who cannot attend may give their vote to someone else to cast on their behalf. It is possible to entrench certain clauses in a company's constitution so that these clauses require 100% of the members to approve their amendment.

Companies Limited by Shares
A public limited company is one which has a share capital of at least £50 000 and which says in its Memorandum and Articles of Association that it is a public limited company. A plc can sell its shares publicly on the stock exchange. A Private Company Limited by Shares has shares which cannot be sold to the general public but the ownership of shares gives a right to a share of company profits.

If the company goes into liquidation and cannot pay all its debts the shareholders lose their investment, but that is the limit of their liability. Shares provide equity i.e. fixed capital in the business which can be used as security. The shares provide 'equity' which a company can use both to secure investment and as leverage for raising additional finance. Shares are transferable from one person to another (but cannot usually be sold to the general public) and normally increase in value as the company grows. The advantages of this are clear to an individual investor: the value of their investment grows with the company and can be sold.

Company Limited by Guarantee
As it is difficult to maintain social or community principles in a share capital company, most social enterprises which use the company form register as Companies Limited by Guarantee. Each member guarantees to pay a certain amount (normally £1) towards the company's debts should it become insolvent. Membership is therefore not linked to investment and one member one vote is easily written into the rules. Guarantees, unlike shares, provide no equity and raising finance must therefore be through grants or loans. However, the lack of equity makes the company a much less attractive proposition for lenders to provide loan finance. Therefore companies limited by guarantee are often overly dependant on grant finance.

The guarantee structure has a major weakness for many community renewable schemes. Most need a high level of initial capital investment. And yet the guarantee form prevents them raising any equity and the lack of equity excludes them from many forms of loan finance. In a market where grant finance is being squeezed, this makes the task of raising the necessary capital for a community renewable scheme much harder.

Community Interest Companies (CIC's)

The Community Interest Company (CIC) is a new type of company introduced in July 2005, designed for social enterprises that want to use their profits and assets for the public good. CICs are relatively easy to set up, with all the flexibility and certainty of the company form, but with some special features to ensure they are working for the benefit of the community. An applicant to be a CIC must demonstrate that 'a reasonable person' would accept that the work that the applicant plans to undertake is for the benefit of the community.

CIC's report to an independent regulator on how they are delivering benefit for the community and how they are involving their stakeholders in their activities. There is an 'asset lock' on a CIC meaning that its assets must be used for the social purpose of the CIC and that this will be regulated by the CIC regulator.

CIC's can be limited by shares or guarantee. Where they are limited by shares there is a maximum limit on the rate of return for shareholders and a limit on the voting rights of investor members.
It is therefore possible to combine equity with social purpose in a CIC. However, there is a catch. Share offers to the public can only be made by public limited by companies through an authorised share offer. Authorised share offers are both complex and expensive – at least £10k. There are no exemptions from this need for authorisation for CICs.

Industrial & Provident Society (IPS)

An IPS is an incorporated body with limited liability under the Industrial and Provident Societies Acts 1965-2002 and the Co-operative and Community Benefit Societies Act 2003 and is registered with the Financial Service Authority. IPS's can be either a *bona fide* co-operatives or societies for the benefit of the community. IPS's are limited by shares, but these are different from company shares - they do not gain in face value and can be bought back by the IPS. One member, one vote always applies, no matter what a member's shareholding (which is currently up to a legal maximum of £20 000). IPS shares provide equity which the society can use both for raising investment and securing additional loan finance. Having said that, many IPS's choose to register with a nominal £1 shareholding per member.

A minimum of three members is required to form an IPS. IPS rules are usually shorter and easier to follow than a company's. IPS's are more expensive to register, but subsequent paperwork required by the FSA is less than for a company. IPS legislation was brought in specifically for the needs of co-operatives and social benefit organisations. Not only will the FSA check the original rules to see if they reflect the principles laid down the Acts, but it has a brief to protect the original intentions of the founders and may rule out certain rule changes as contrary to their intentions. Community benefit societies (bencoms) can have an asset lock in their Rules similar to that for CIC's.

Because the FSA has a positive brief to check the rules of any new society to see if they comply with the legislation, registration of a non-model set of rules can be a long drawn out process. Most IPS's therefore tend to register with a model set of rules with very few amendments.

IPS's must be democratic organisations, based on one member, one vote. Whilst this can be seen as a virtue, it has unanticipated consequences. Many social economy organisations make provision for reserved seats on their Board (e.g. for the local Council or a parent body) or wish to ensure representation for different groups of members. The FSA will generally only allow this if those on the Board elected from a particular category of membership are elected by the whole membership.

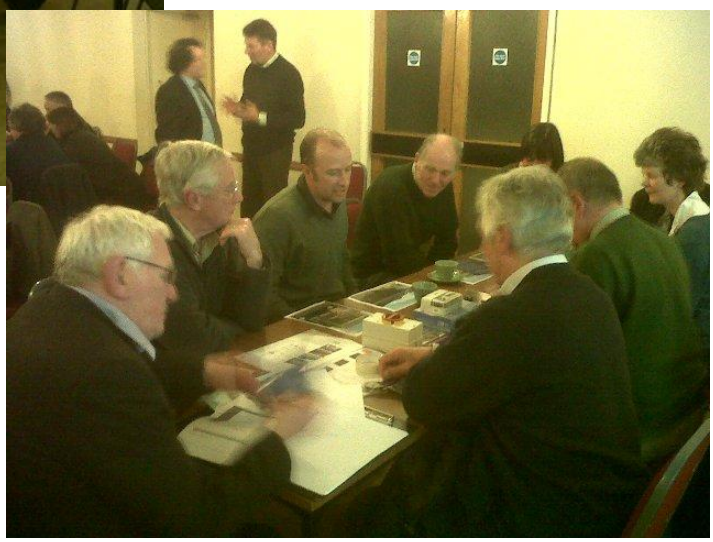
IPSs in which shares are withdrawable but not transferable (that is cannot be sold to anyone other than the society) have exemptions from the rules on authorised share issues. So a Society can offer its shares to the public, although care must still be taken to comply with other parts of the law. This opens up the prospect of raising equity from the local community and increasing numbers of community renewable schemes are using this route as a way of raising some of their initial capital.

Charitable Status

Charity status is not normally suitable for community renewable schemes as the generation of renewable energy is not a charitable purpose.

A Final Word

Any developing community renewables scheme should take professional advice on the most appropriate legal form for them. There are, unfortunately, many examples where groups have taken time and expense to register a legal form which does not meet their needs.



APPENDIX 3: Guide to the Renewable Heat Incentive

When the SEE? Project was originally commissioned, the Government hadn't yet announced details relating to the payments it proposed for generating heat through renewable and low carbon sources. Some details are still waiting confirmation, but we thought it would be useful to include a short overview piece. The ability to generate another revenue stream from changing the way we heat our homes and businesses will surely have great resonance in rural areas and Eden in particular.

Department of Energy and Climate Change says:
The best and most cost-effective way to reduce emissions from domestic heating is to make our homes better insulated and more energy efficient. That is what the Green Deal will do when it is introduced in Autumn 2012. But we also need to promote a shift in the type of heat that we use. Increasing renewable heat is therefore a key objective for this Government. The Renewable Heat Incentive (RHI) will help accelerate deployment by providing a financial incentive to install renewable heating in place of fossil fuels.

Technologies covered by this scheme:

- Wood fuelled heating, including biomass boilers
- Air source heat pumps
- Ground source heat pumps
- Solar hot water systems are all eligible as part of the Renewable Heat Incentive.

An important pre-requisite:
You must ensure that your home is fully insulated and energy efficient. There's no point generating your own energy if you lose most of it through gaps in windows and un-insulated walls and lofts, and your installation won't be eligible for payments under this scheme.

There are two strands to the incentive:
Domestic and non-domestic. The domestic strand - the one that will benefit you and your home - has been split into two phases.

Phase 1 is an offering of the Renewable Heat Premium. From what might be as early as July 2011 you could be eligible for a financial contribution towards installing a new technology.
These direct payments will subsidise the cost of installing qualifying renewable heating systems, focusing support for *primary* heating systems, such as heat pumps and biomass boilers, on households off the gas grid, where fossil fuels like heating oil are both more expensive and have higher carbon content. Renewable Heat Premium Payments launched in July 2011 with further details published in May 2011. Likely levels of support:

Solar Thermal	-	£300 / unit
Air Source Heat Pumps	-	£850 / unit
Biomass Boilers	-	£950 / unit
Ground Source Heat Pumps	-	£1250 / unit

Phase 2 would be the start of Renewable Heat Incentive payments for existing and new eligible installations. Householders would be paid a tariff for each kWh of renewable heat generated over the lifetime of the technology. The tariffs and lifetime of tariff payments will be confirmed towards the end of 2011.

Can you apply yet?
The details are yet to be confirmed. Keep your eyes peeled and regularly check at the Energy Saving Trust website where they'll be announcing details as soon as they are known (likely to be July 2011).

Eligible installations dates:
Any installations you had completed or commissioned on, or after, the **15th July 2009** will be eligible for the Renewable Heat Incentive **tariffs** (phase 2) when it becomes available. Although bear in mind that this is providing they meet the final eligibility criteria.

What criteria determine a domestic installation?
A domestic unit is defined as being a single renewable heat installation serving a single domestic premises (a single house or flat). To give you an example, a social landlord installing individual heat pumps in multiple homes would also be considered as a domestic installation. Although there may be limits to how the premium payment is applied to landlords.

Where can I find more information?
The above information isn't by any means exhaustive, because full details are yet to be released. However, you can visit the DECC website for all the documents available of the Renewable Heat Incentive. You can also call the Energy Saving trust advice line on: 0800 512 012.

Picture courtesy of Carl Bendelow

APPENDIX 4: FIT's, Costs, Scale and Outputs

As we know, when the wind doesn't blow, the turbines don't go. Equally when the sun isn't out, the panels do nowt! In this scenario you simply are taking normal electricity from the grid as you do now, and paying for it at prevailing prices.

However, when they do work, the Governments Feed in Tariffs (FITs) ensure that you get paid for what is produced. The amount per kWh produced is paid to you even if you aren't at home using it and is dependant upon the size and type of device you have. In fact, there is an additional payment called the 'export tariff' which is paid on top of the FITs when you are simply generating and not using. See an example in the table below:

Feed in Tariff		Install up to 31/3/11	Install up to 31/3/12	Install up to 31/3/13	Years guaranteed to pay you
Hydro	Up to 15kW	19.9p	19.9p	19.9p	20
Hydro	>15 – 100kW	17.8p	17.8p	17.8p	20
PV	Up to 4kW (new)	36.1p	36.1p	33p	25
PV	Up to 4kW(retro)	41.3p	41.3p	37.8p	25
PV	>4 – 10kW	36.1p	36.1p	33p	25
PV	>10 – 100kW	31.4p	31.4p	28.7p	25
Wind	>1.5 – 15kW	26.7p	26.7p	25.5p	20
Wind	>15 – 100kW	24.1	24.1	23p	20
Wind	>100 – 500kW	18.8p	18.8p	18.8p	20
Wind	>500 – 1.5MW	9.4p	9.4p	9.4p	20

- The installation must be done by an accredited company (MCS)
- FITs are tax free for domestic installations
- They are paid irrespective of whether you use the power or not
- Export Tariff (approx 3p per kWh) is paid in addition when power not used
- Guaranteed income for 20 – 25 years dependant upon type of scheme
- Index linked to RPI, so will rise every year in line with inflation
- Government will review future FITs payments, not those already installed

There are many caveats to the following approximations and expert advice must be sought in each case from an accredited Microgeneration Certified Scheme (MCS) installer, but to give you an idea of potential:

Wind

Typical larger community 1.5MW turbine on 50m tower, costs £2m, generates 3,285MWh per annum, earns £308,790 p.a. and saves 1,830 tonnes CO_2 p.a.

Typical community scale 250kW turbine on 40m tower, costs £500,000, generates 547MWh per annum, earns £109,930 p.a. and saves 304 tonnes CO_2 p.a.

Typical business scale 80kW turbine on 30m tower, costs £250,000, generates 175MWh per annum, earns £42,223 p.a. and saves 97 tonnes CO_2p.a.

Typical domestic scale 6kW turbine on 11m tower, costs £28,000, generates 13,140kWh per annum, earns £3508 p.a. and saves 7.3 tonnes CO_2 p.a.

Typical house is 8.5m to the ridge

*http://www.rensmart.com/

Typical domestic scale 2kWp retro-fit Solar PV 15m^2 roof installation, costs £10,000,
Generates 1,600kWh p.a., earns £800 p.a. and saves 1 tonne CO_2 p.a.

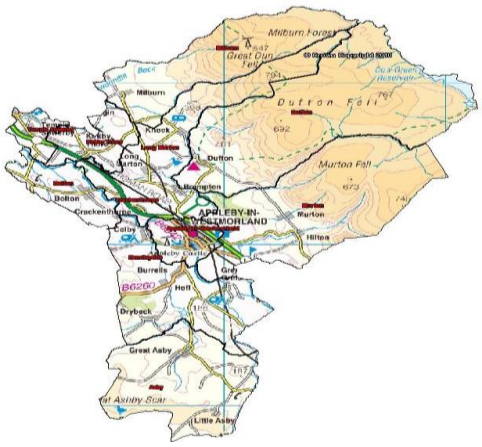
Typical business scale 10kWp retro-fit Solar PV 75m^2 roof installation costs £37,000,
Generates 7,700kWh p.a., earns £2,846 p.a. and saves 4 tonnes CO_2 p.a.

Typical community scale 50kWp retro-fit Solar PV 375m^2 roof installation costs £174,000,
Generates 39,000kWh p.a., earns £15,700 p.a. and saves 21 tonnes CO_2 p.a.
* http://www.solarguide.co.uk/solar-pv-calculator

The costs of installing a small-scale hydro electric power scheme are highly dependent on the site, but according to UK Energy Saving Trust, as a general guide you need to allow £4000 per kW up to 10kW with the per KW price becoming proportionally less for larger projects.

APPENDIX 5: Detailed Parish Profiles

Heart of Eden



The Heart of Eden consists of a collection of parishes with the district of Eden. The area has a population of 6,193. The area contains 2,922 households, of which 1,033 are detached, 1,619 are semi-detached or terraced and 270 are flats/maisonettes. 68% of the houses are owner-occupied, with the remaining 32% either rented, vacant or second homes/holiday lets.

Electricity Consumption & Cost

Domestic electricity consumption in Eden District is amongst the highest in the country with average annual use per household standing at 5,726kWh (UK average = 4,440kWh). Across the Heart of Eden as a whole this equates to a total annual electricity consumption of 16,731 MWh (1,000kWh = 1MWh).

Based on central electricity retail price estimations from DECC the annual cost of electricity consumption in 2011 and 2021 is as follows:

	Household	Parish
At current rate: 12.0p/kWh	£687	£2,007,414
Rate in 2021: 15.3p/kWh	£876	£2,559,672

Calculating Carbon Emissions from Electricity Consumption

The official figure for the amount of carbon produced per delivered kWh of electricity is 0.52kg. This figure varies depending on the current "generation mix" from power stations and up to date figures for the current carbon intensity of electricity production can be found at: http://www.realtimecarbon.org/

So, based on an area wide annual domestic consumption of 16,731 MWh of electricity, and an up to date carbon intensity of 557kg per MWh, the estimated total carbon footprint attributed to domestic electricity use in the Heart of Eden is 9,321 tonnes per year. On this basis, the average annual CO_2 based on electricity usage alone is 3.19 tonnes per household. NB: This doesn't include business, industrial or transport emissions which will be substantially higher.

Measuring the Potential Impact of Renewable Sources of Electricity

Using some additional assumptions we have calculated the level of renewable energy resource required to offset domestic electricity use in Heart of Eden. Of course, the sun doesn't always shine when you need electricity, nor the wind blow, but it is free when it does, so our assumptions are based on conservative industry norms.

Solar PV

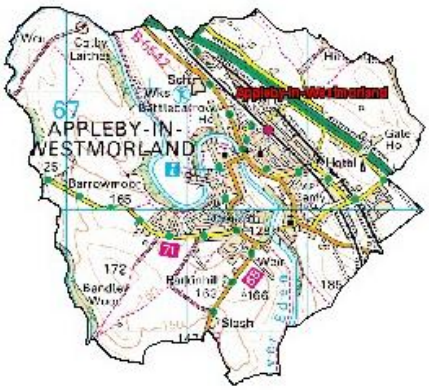
If the Heart of Eden wanted to offset its annual domestic electricity consumption through the use of solar panels then 13,030 typical domestic systems (15m^2), or an area of 15.6 hectares, would be required. This is approximately 14.5 full sized football pitches. The associated CO_2 saving would be approximately 7,193 tonnes per year, 77% of the annual domestic footprint.

Wind

Wind turbines come in a variety of sizes. Assuming an efficiency rating of 25%, if the Heart of Eden wanted to offset its annual domestic energy generation, then it would require:

1273	x	small domestic scale 6kW turbines on 11m towers
95.5	x	medium sized 80kW turbines on 30m towers
30.6	x	community scale 250kW turbines on 40m towers
5.1	x	large community scale 1.5MW turbines on 50m towers

Appleby-in-Westmorland



Appleby-in-Westmorland is a key service centre in the Heart of Eden with a population of 2,862. The Parish contains 1,380 households, of which 321 are detached, 842 are semi-detached or terraced and 217 are flats/maisonettes. 69% of the houses are owner-occupied, with the remaining 31% either rented, vacant or second homes/holiday lets.

Electricity Consumption & Cost

Domestic electricity consumption in Eden District is amongst the highest in the country with average annual use per household standing at 5,726kWh (UK average = 4,440kWh). Across the Parish of Appleby-in-Westmorland as a whole this equates to a total annual electricity consumption of 7,902 MWh (1,000kWh = 1MWh). This is the only community on mains gas in the heart of Eden.

Based on central electricity retail price estimations from DECC the annual cost of electricity consumption in 2011 and 2021 is as follows:

	Household	Parish
At current rate: 12.0p/kWh	£687	£948,240
Rate in 2021: 15.3p/kWh	£876	£1,209,010

Calculating Carbon Emissions from Electricity Consumption

The official figure for the amount of carbon produced per delivered kWh of electricity is 0.52kg. This figure varies depending on the current "generation mix" from power stations and up to date figures for the current carbon intensity of electricity production can be found at: http://www.realtimecarbon.org/

So, based on a parish wide annual consumption of 7,902 MWh of electricity, and an up to date carbon intensity of 557kg per MWh, the estimated total carbon footprint attributed to domestic electricity use in Appleby-in-Westmorland is 4,402 tonnes per year. On this basis, the average annual CO_2 based on electricity usage alone is 3.19 tonnes per household. NB: This doesn't include business, industrial or transport emissions which will be substantially higher.

Measuring the Potential Impact of Renewable Sources of Electricity

Using some additional assumptions we have calculated the level of renewable energy resource required to offset domestic electricity use in Appleby-in-Westmorland.

Solar PV

If Appleby-in-Westmorland wanted to offset its annual domestic electricity consumption through the use of solar panels then 4,933 typical domestic systems (15m^2), or an area of 7.39 hectares, would be required. This is approximately 6.84 full sized football pitches. The associated CO_2 saving would be approximately 3,397 tonnes per year, 77% of the annual domestic footprint.

Wind

Wind turbines come in a variety of sizes. Assuming an efficiency rating of 25%, if Appleby-in-Westmorland wanted to offset its annual domestic energy generation, then it would require:

601 x small domestic scale 6kW turbines on 11m towers
45.1 x medium sized 80kW turbines on 30m towers
14.4 x community scale 250kW turbines on 40m towers
2.4 x large community scale 1.5MW turbines on a 50m tower Funding / Finance

Asby

Asby is a small Parish in the Heart of Eden with a population of 280. The Parish contains 151 households, of which 75 are detached, 69 are semi-detached or terraced and 7 are flats/maisonettes. 62% of the houses are owner-occupied, with the remaining 38% either rented, vacant or second homes/holiday lets.

Electricity Consumption & Cost

Domestic electricity consumption in Eden District is amongst the highest in the country with average annual use per household standing at 5,726kWh (UK average = 4,440kWh). Across the Parish of Asby as a whole this equates to a total annual electricity consumption of 865 MWh (1,000kWh = 1MWh).

Based on central electricity retail price estimations from DECC the annual cost of electricity consumption in 2011 and 2021 is as follows:

	Household	Parish
At current rate: 12.0p/kWh	£687	£103,800
Rate in 2021: 15.3p/kWh	£876	£132,350

Calculating Carbon Emissions from Electricity Consumption

The official figure for the amount of carbon produced per delivered kWh of electricity is 0.52kg. This figure varies depending on the current "generation mix" from power stations and up to date figures for the current carbon intensity of electricity production can be found at: http://www.realtimecarbon.org/

So, based on a parish wide annual consumption of 865 MWh of electricity, and an up to date carbon intensity of 557kg per MWh, the estimated total carbon footprint attributed to domestic electricity use in Asby is 482 tonnes per year. On this basis, the average annual CO_2 based on electricity usage alone is 3.19 tonnes per household. NB: This doesn't include business, industrial or transport emissions which will be substantially higher.

Measuring the Potential Impact of Renewable Sources of Electricity

Using some additional assumptions we have calculated the level of renewable energy resource required to offset domestic electricity use in Asby.

Solar PV

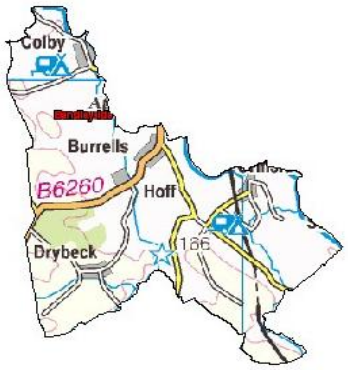
If Asby wanted to offset its annual domestic electricity consumption through the use of solar panels then 540 typical domestic systems (15m^2), or an area of 0.81 hectares, would be required. This is approximately 0.75 full sized football pitches. The associated CO_2 saving would be approximately 372 tonnes per year, 77% of the annual domestic footprint.

Wind

Wind turbines come in a variety of sizes. Assuming an efficiency rating of 25%, if Asby wanted to offset its annual domestic energy generation, then it would require:

66 x small domestic scale 6kW turbines on 11m towers
4.9 x medium sized 80kW turbines on 30m towers
1.6 x community scale 250kW turbines on 40m towers
0.3 x large community scale 1.5MW turbine on a 50m tower

Bandleyside/Colby



Bandleyside/Colby is a small Parish in the Heart of Eden with a population of 120. The Parish contains 58 households, of which 39 are detached, 19 are semi-detached or terraced and 0 are flats/maisonettes. 79% of the houses are owner-occupied, with the remaining 21% either rented, vacant or second homes/holiday lets.

Electricity Consumption & Cost

Domestic electricity consumption in Eden District is amongst the highest in the country with average annual use per household standing at 5,726kWh (UK average = 4,440kWh). Across the Parish of Bandleyside/Colby as a whole this equates to a total annual electricity consumption of 332 MWh (1,000kWh = 1MWh).

Based on central electricity retail price estimations from DECC the annual cost of electricity consumption in 2011 and 2021 is as follows:

	Household	Parish
At current rate: 12.0p/kWh	£687	£39,840
Rate in 2021: 15.3p/kWh	£876	£50,800

Calculating Carbon Emissions from Electricity Consumption

The official figure for the amount of carbon produced per delivered kWh of electricity is 0.52kg. This figure varies depending on the current "generation mix" from power stations and up to date figures for the current carbon intensity of electricity production can be found at: http://www.realtimecarbon.org/

So, based on a parish wide annual consumption of 332 MWh of electricity, and an up to date carbon intensity of 557kg per MWh, the estimated total carbon footprint attributed to domestic electricity use in Bandleyside/Colby is 185 tonnes per year. On this basis, the average annual CO_2 based on electricity usage alone is 3.19 tonnes per household. NB: This doesn't include business, industrial or transport emissions which will be substantially higher.

Measuring the Potential Impact of Renewable Sources of Electricity

Using some additional assumptions we have calculated the level of renewable energy resource required to offset domestic electricity use in Bandleyside/Colby.

Solar PV

If Bandleyside/Colby wanted to offset its annual domestic electricity consumption through the use of solar panels then 259 typical domestic systems (15m^2), or an area of 0.31 hectares, would be required. This is approximately 0.29 full sized football pitches. The associated CO_2 saving would be approximately 143 tonnes per year, 77% of the annual domestic footprint.

Wind

Wind turbines come in a variety of sizes. Assuming an efficiency rating of 25%, if Bandleyside/Colby wanted to offset its annual domestic energy generation, then it would require:

25	x	small domestic scale 6kW turbines on 11m towers
1.9	x	medium sized 80kW turbines on 30m towers
0.6	x	community scale 250kW turbine on 40m towers
0.1	x	large community scale 1.5MW turbine on a 50m tower

Bolton

Bolton is a small Parish in the Heart of Eden with a population of 416. The Parish contains 165 households, of which 105 are detached, 52 are semi-detached or terraced and 8 are flats/maisonettes. 70% of the houses are owner-occupied, with the remaining 30% either rented, vacant or second homes/holiday lets.

Electricity Consumption & Cost

Domestic electricity consumption in Eden District is amongst the highest in the country with average annual use per household standing at 5,726kWh (UK average = 4,440kWh). Across the Parish of Bolton as a whole this equates to a total annual electricity consumption of 945 MWh (1,000kWh = 1MWh).

Based on central electricity retail price estimations from DECC the annual cost of electricity consumption in 2011 and 2021 is as follows:

	Household	Parish
At current rate: 12.0p/kWh	£687	£113,400
Rate in 2021: 15.3p/kWh	£876	£144,590

Calculating Carbon Emissions from Electricity Consumption

The official figure for the amount of carbon produced per delivered kWh of electricity is 0.52kg. This figure varies depending on the current "generation mix" from power stations and up to date figures for the current carbon intensity of electricity production can be found at: http://www.realtimecarbon.org/

So, based on a parish wide annual consumption of 945 MWh of electricity, and an up to date carbon intensity of 557kg per MWh, the estimated total carbon footprint attributed to domestic electricity use in Bolton is 526 tonnes per year.

Measuring the Potential Impact of Renewable Sources of Electricity

Using some additional assumptions we have calculated the level of renewable energy resource required to offset domestic electricity use in Bolton. Of course, the sun doesn't always shine when you need electricity, nor the wind blow, but it is free when it does, so our assumptions are based on conservative industry norms.

Solar PV

If Bolton wanted to offset its annual domestic electricity consumption through the use of solar panels then 736 typical domestic systems (15m^2), or an area of 0.88 hectares, would be required. This is approximately 0.82 full sized football pitches. The associated CO_2 saving would be approximately 406 tonnes per year, 77% of the annual domestic footprint.

Wind

Wind turbines come in a variety of sizes. Assuming an efficiency rating of 25%, if Bolton wanted to offset its annual domestic energy generation, then it would require:

72	x	small domestic scale 6kW turbines on 11m towers
5.4	x	medium sized 80kW turbines on 30m towers
1.7	x	community scale 250kW turbines on 40m towers
0.3	x	large community scale1.5MW turbine on a 50m tower

Crackenthorpe

Crackenthorpe is a small Parish in the Heart of Eden with a population of 77. The Parish contains 35 households, of which 22 are detached, 13 are semi-detached or terraced and no flats or maisonettes. 66% of the houses are owner-occupied, with the remaining 34% either rented, vacant or second homes/holiday lets.

Electricity Consumption & Cost

Domestic electricity consumption in Eden District is amongst the highest in the country with average annual use per household standing at 5,726kWh (UK average = 4,440kWh). Across the Parish of Crackenthorpe as a whole this equates to a total annual electricity consumption of 200 MWh (1,000kWh = 1MWh).

Based on central electricity retail price estimations from DECC the annual cost of electricity consumption in 2011 and 2021 is as follows:

	Household	Parish
At current rate: 12.0p/kWh	£687	£24,000
Rate in 2021: 15.3p/kWh	£876	£30,600

Calculating Carbon Emissions from Electricity Consumption

The official figure for the amount of carbon produced per delivered kWh of electricity is 0.52kg. This figure varies depending on the current "generation mix" from power stations and up to date figures for the current carbon intensity of electricity production can be found at: http://www.realtimecarbon.org/

So, based on a parish wide annual consumption of 200 MWh of electricity, and an up to date carbon intensity of 557kg per MWh, the estimated total carbon footprint attributed to domestic electricity use in Crackenthorpe is 112 tonnes per year. On this basis, the average annual CO_2 based on electricity usage alone is 3.19 tonnes per household. (NB: This doesn't include business, industrial or transport emissions which will be substantially higher.

Measuring the Potential Impact of Renewable Sources of Electricity

Using some additional assumptions we have calculated the level of renewable energy resource required to offset domestic electricity use in Crackenthorpe.

Solar PV

If Crackenthorpe wanted to offset its annual domestic electricity consumption through the use of solar panels then 156 typical domestic systems (15m^2), or an area of 0.19 hectares, would be required. This is approximately 0.17 full sized football pitches. The associated CO_2 saving would be approximately 86 tonnes per year, 77% of the annual domestic footprint.

Wind

Wind turbines come in a variety of sizes. Assuming an efficiency rating of 25%, if Crackenthorpe wanted to offset its annual domestic energy generation, then it would require:

15	x	small domestic scale 6kW turbines on 11m towers
1.1	x	medium sized 80kW turbines on 30m towers
0.4	x	community scale 250kW turbine on 40m towers
0.1	x	large community scale1.5MW turbine on a 50m tower

Dufton

Dufton is a small Parish in the Heart of Eden with a population of 169. The Parish contains 98 households, of which 52 are detached, 43 are semi-detached or terraced and 3 are flats/maisonettes. 67% of the houses are owner-occupied, with the remaining 33% either rented, vacant or second homes/holiday lets.

Electricity Consumption & Cost

Domestic electricity consumption in Eden District is amongst the highest in the country with average annual use per household standing at 5,726kWh (UK average = 4,440kWh). Across the Parish of Dufton as a whole this equates to a total annual electricity consumption of 561 MWh (1,000kWh = 1MWh).

Based on central electricity retail price estimations from DECC the annual cost of electricity consumption in 2011 and 2021 is as follows:

	Household	Parish
At current rate: 12.0p/kWh	£687	£67,320
Rate in 2021: 15.3p/kWh	£876	£85,830

Calculating Carbon Emissions from Electricity Consumption

The official figure for the amount of carbon produced per delivered kWh of electricity is 0.52kg. This figure varies depending on the current "generation mix" from power stations and up to date figures for the current carbon intensity of electricity production can be found at: http://www.realtimecarbon.org/

So, based on a parish wide annual consumption of 561 MWh of electricity, and an up to date carbon intensity of 557kg per MWh, the estimated total carbon footprint attributed to domestic electricity use in Dufton is 313 tonnes per year. On this basis, the average annual CO_2 based on electricity usage alone is 3.19 tonnes per household. NB: This doesn't include business, industrial or transport emissions which will be substantially higher.

Measuring the Potential Impact of Renewable Sources of Electricity

Using some additional assumptions we have calculated the level of renewable energy resource required to offset domestic electricity use in Dufton.

Solar PV

If Dufton wanted to offset its annual domestic electricity consumption through the use of solar panels then 437 typical domestic systems (15m^2), or an area of 0.52 hectares, would be required. This is approximately 0.49 full sized football pitches. The associated CO_2 saving would be approximately 241 tonnes per year, 77% of the annual domestic footprint.

Wind

Wind turbines come in a variety of sizes. Assuming an efficiency rating of 25%, if Dufton wanted to offset its annual domestic energy generation, then it would require:

43	x	small domestic scale 6kW turbines on 11m towers
3.2	x	medium sized 80kW turbines on 30m towers
1.0	x	community scale 250kW turbine on 40m towers
0.2	x	large community scale 1.5MW turbine on a 50m tower

Kirkby Thore

Kirkby Thore is a larger Parish in the Heart of Eden with a population of 731. The Parish contains 310 households, of which 94 are detached, 210 are semi-detached or terraced and 6 are flats/maisonettes. 59% of the houses are owner-occupied, with the remaining 41% either rented, vacant or second homes/holiday lets.

Electricity Consumption & Cost

Domestic electricity consumption in Eden District is amongst the highest in the country with average annual use per household standing at 5,726kWh (UK average = 4,440kWh). Across the Parish of Kirkby Thore as a whole this equates to a total annual electricity consumption of 1,775 MWh (1,000kWh = 1MWh).

Based on central electricity retail price estimations from DECC the annual cost of electricity consumption in 2011 and 2021 is as follows:

	Household	Parish
At current rate: 12.0p/kWh	£687	£213,000
Rate in 2021: 15.3p/kWh	£876	£271,580

Calculating Carbon Emissions from Electricity Consumption

The official figure for the amount of carbon produced per delivered kWh of electricity is 0.52kg. This figure varies depending on the current "generation mix" from power stations and up to date figures for the current carbon intensity of electricity production can be found at: http://www.realtimecarbon.org/

So, based on a parish wide annual consumption of 1,775 MWh of electricity, and an up to date carbon intensity of 557kg per MWh, the estimated total carbon footprint attributed to domestic electricity use in Kirkby Thore is 989 tonnes per year. On this basis, the average annual CO_2 based on electricity usage alone is 3.19 tonnes per household. (NB: This doesn't include business, industrial or transport emissions which will be substantially higher.)

Measuring the Potential Impact of Renewable Sources of Electricity

Using some additional assumptions we have calculated the level of renewable energy resource required to offset domestic electricity use in Kirkby Thore.

Solar PV

If Kirkby Thore wanted to offset its annual domestic electricity consumption through the use of solar panels then 1,382 typical domestic systems (15m^2), or an area of 1.66 hectares, would be required. This is approximately 1.54 full sized football pitches. The associated CO_2 saving would be approximately 763 tonnes per year, 77% of the annual domestic footprint.

Wind

Wind turbines come in a variety of sizes. Assuming an efficiency rating of 25%, if Kirkby Thore wanted to offset its annual domestic energy generation, then it would require:

135	x	small domestic scale 6kW turbines on 11m towers
10.1	x	medium sized 80kW turbines on 30m towers
3.2	x	community scale 250kW turbines on 40m towers
0.5	x	large community scale1.5MW turbine on a 50m tower

Long Marton

Long Marton is a larger Parish in the Heart of Eden with a population of 704. The Parish contains 348 households, of which 138 are detached, 187 are semi-detached or terraced and 23 are flats/maisonettes. 72% of the houses are owner-occupied, with the remaining 28% either rented, vacant or second homes/holiday lets.

Electricity Consumption & Cost

Domestic electricity consumption in Eden District is amongst the highest in the country with average annual use per household standing at 5,726kWh (UK average = 4,440kWh). Across the Parish of Long Marton as a whole this equates to a total annual electricity consumption of 1,993 MWh (1,000kWh = 1MWh).

Based on central electricity retail price estimations from DECC the annual cost of electricity consumption in 2011 and 2021 is as follows:

	Household	Parish
At current rate: 12.0p/kWh	£687	£239,160
Rate in 2021: 15.3p/kWh	£876	£304,930

Calculating Carbon Emissions from Electricity Consumption

The official figure for the amount of carbon produced per delivered kWh of electricity is 0.52kg. This figure varies depending on the current "generation mix" from power stations and up to date figures for the current carbon intensity of electricity production can be found at: http://www.realtimecarbon.org/

So, based on a parish wide annual consumption of 1,993 MWh of electricity, and an up to date carbon intensity of 557kg per MWh, the estimated total carbon footprint attributed to domestic electricity use in Long Marton is 1,110 tonnes per year. On this basis, the average annual CO_2 based on electricity usage alone is 3.19 tonnes per household. NB: This doesn't include business, industrial or transport emissions which will be substantially higher.

Measuring the Potential Impact of Renewable Sources of Electricity

Using some additional assumptions we have calculated the level of renewable energy resource required to offset domestic electricity use in Long Marton.

Solar PV

If Long Marton wanted to offset its annual domestic electricity consumption through the use of solar panels then 1,552 typical domestic systems ($15m^2$), or an area of 1.86 hectares, would be required. This is approximately 1.72 full sized football pitches. The associated CO_2 saving would be approximately 857 tonnes per year, 77% of the annual domestic footprint.

Wind

Wind turbines come in a variety of sizes. Assuming an efficiency rating of 25%, if Long Marton wanted to offset its annual domestic energy generation, then it would require:

152 **x** **small domestic scale 6kW turbines** on 11m towers
11.4 **x** **medium sized 80kW turbines** on 30m towers
3.6 **x** **community scale 250kW turbines** on 40m towers
0.6 **x** **large community scale 1.5MW turbine** on a 50m tower

Milburn

Milburn is a small Parish in the Heart of Eden with a population of 171. The Parish contains 79 households, of which 40 are detached, 36 are semi-detached or terraced and 3 are flats/maisonettes. 68% of the houses are owner-occupied, with the remaining 32% either rented, vacant or second homes/holiday lets.

Electricity Consumption & Cost

Domestic electricity consumption in Eden District is amongst the highest in the country with average annual use per household standing at 5,726kWh (UK average = 4,440kWh). Across the Parish of Milburn as a whole this equates to a total annual electricity consumption of 452 MWh (1,000kWh = 1MWh).

Based on central electricity retail price estimations from DECC the annual cost of electricity consumption in 2011 and 2021 is as follows:

	Household	Parish
At current rate: 12.0p/kWh	£687	£54,240
Rate in 2021: 15.3p/kWh	£876	£69,160

Calculating Carbon Emissions from Electricity Consumption

The official figure for the amount of carbon produced per delivered kWh of electricity is 0.52kg. This figure varies depending on the current "generation mix" from power stations and up to date figures for the current carbon intensity of electricity production can be found at: http://www.realtimecarbon.org/

So, based on a parish wide annual consumption of 452 MWh of electricity, and an up to date carbon intensity of 557kg per MWh, the estimated total carbon footprint attributed to domestic electricity use in Milburn is 252 tonnes per year. On this basis, the average annual CO_2 based on electricity usage alone is 3.19 tonnes per household. NB: This doesn't include business, industrial or transport emissions which will be substantially higher.

Measuring the Potential Impact of Renewable Sources of Electricity

Using some additional assumptions we have calculated the level of renewable energy resource required to offset domestic electricity use in Milburn.

Solar PV

If Milburn wanted to offset its annual domestic electricity consumption through the use of solar panels then 352 typical domestic systems (15m^2), or an area of 0.42 hectares, would be required. This is approximately 0.39 full sized football pitches. The associated CO_2 saving would be approximately 194 tonnes per year, 77% of the annual domestic footprint.

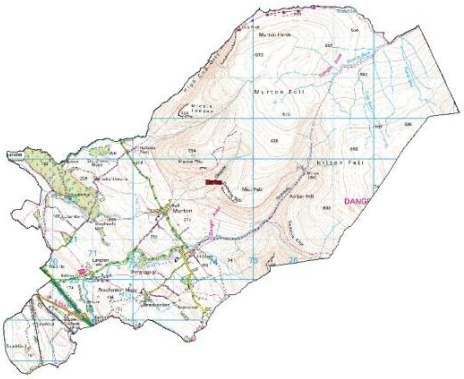
Wind

Wind turbines come in a variety of sizes. Assuming an efficiency rating of 25%, if Milburn wanted to offset its annual domestic energy generation, then it would require:

34 **x** **small domestic scale 6kW turbines** on 11m towers
2.6 **x** **medium sized 80kW turbines** on 30m towers
0.8 **x** **community scale 250kW turbine** on 40m towers
0.1 **x** **large community scale1.5MW turbine** on a 50m tower

Murton

Murton is a small Parish in the Heart of Eden with a population of 330. The Parish contains 150 households, of which 97 are detached, 50 are semi-detached or terraced and 3 are flats/maisonettes. 75% of the houses are owner-occupied, with the remaining 25% either rented, vacant or second homes/holiday lets.



Electricity Consumption & Cost

Domestic electricity consumption in Eden District is amongst the highest in the country with average annual use per household standing at 5,726kWh (UK average = 4,440kWh). Across the Parish of Murton as a whole this equates to a total annual electricity consumption of 859 MWh (1,000kWh = 1MWh).

Based on central electricity retail price estimations from DECC the annual cost of electricity consumption in 2011 and 2021 is as follows:

	Household	Parish
At current rate: 12.0p/kWh	£687	£103,080
Rate in 2021: 15.3p/kWh	£876	£131,430

Calculating Carbon Emissions from Electricity Consumption

The official figure for the amount of carbon produced per delivered kWh of electricity is 0.52kg. This figure varies depending on the current "generation mix" from power stations and up to date figures for the current carbon intensity of electricity production can be found at: http://www.realtimecarbon.org/

So, based on a parish wide annual consumption of 859 MWh of electricity, and an up to date carbon intensity of 557kg per MWh, the estimated total carbon footprint attributed to domestic electricity use in Murton is 479 tonnes per year. On this basis, the average annual CO_2 based on electricity usage alone is 3.19 tonnes per household. NB: This doesn't include business, industrial or transport emissions which will be substantially higher.

Measuring the Potential Impact of Renewable Sources of Electricity

Using some additional assumptions we have calculated the level of renewable energy resource required to offset domestic electricity use in Murton.

Solar PV

If Murton wanted to offset its annual domestic electricity consumption through the use of solar panels then 669 typical domestic systems (15m^2), or an area of 0.8 hectares, would be required. This is approximately 0.74 full sized football pitches. The associated CO_2 saving would be approximately 369 tonnes per year, 77% of the annual domestic footprint.

Wind

Wind turbines come in a variety of sizes. Assuming an efficiency rating of 25%, if Murton wanted to offset its annual domestic energy generation, then it would require:

65 **x** **small domestic scale 6kW turbines** on 11m towers
4.9 **x** **medium sized 80kW turbines** on 30m towers
1.6 **x** **community scale 250kW turbines** on 40m towers
0.3 **x** **large community scale 1.5MW turbine** on a 50m tower

Temple Sowerby

Temple Sowerby is a small Parish in the Heart of Eden with a population of 333. The Parish contains 148 households, of which 50 are detached, 98 are semi-detached or terraced and no flats or maisonettes. 70% of the houses are owner-occupied, with the remaining 30% either rented, vacant or second homes/holiday lets.

Electricity Consumption & Cost

Domestic electricity consumption in Eden District is amongst the highest in the country with average annual use per household standing at 5,726kWh (UK average = 4,440kWh). Across the Parish of Temple Sowerby as a whole this equates to a total annual electricity consumption of 847 MWh (1,000kWh = 1MWh).

Based on central electricity retail price estimations from DECC the annual cost of electricity consumption in 2011 and 2021 is as follows:

	Household	Parish
At current rate: 12.0p/kWh	£687	£101,640
Rate in 2021: 15.3p/kWh	£876	£129,590

Calculating Carbon Emissions from Electricity Consumption

The official figure for the for the amount of carbon produced per delivered kWh of electricity is 0.52kg. This figure varies depending on the current "generation mix" from power stations and up to date figures for the current carbon intensity of electricity production can be found at: http://www.realtimecarbon.org/

So, based on a parish wide annual consumption of 847 MWh of electricity, and an up to date carbon intensity of 557kg per MWh, the estimated total carbon footprint attributed to domestic electricity use in Temple Sowerby is 472 tonnes per year. On this basis, the average annual CO_2 based on electricity usage alone is 3.19 tonnes per household. NB: This doesn't include business, industrial or transport emissions which will be substantially higher.

Measuring the Potential Impact of Renewable Sources of Electricity

Using some additional assumptions we have calculated the level of renewable energy resource required to offset domestic electricity use in Temple Sowerby.

Solar PV

If Temple Sowerby wanted to offset its annual domestic electricity consumption through the use of solar panels then 660 typical domestic systems ($15m^2$), or an area of 0.79 hectares, would be required. This is approximately 0.73 full sized football pitches. The associated CO_2 saving would be approximately 364 tonnes per year, 77% of the annual domestic footprint.

Wind

Wind turbines come in a variety of sizes. Assuming an efficiency rating of 25%, if Temple Sowerby wanted to offset its annual domestic energy generation, then it would require:

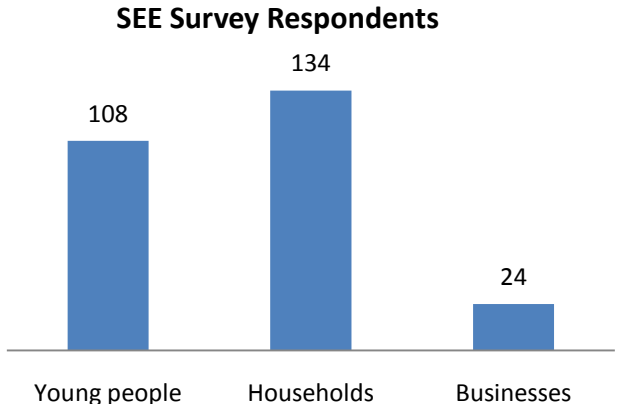
64 **x** **small domestic scale 6kW turbines** on 11m towers
4.8 **x** **medium sized 80kW turbines** on 30m towers
1.5 **x** **community scale 250kW turbines** on 40m towers
0.3 **x** **large community scale 1.5MW turbine** on a 50m tower

APPENDIX 6: Questionnaire Analysis

Overview

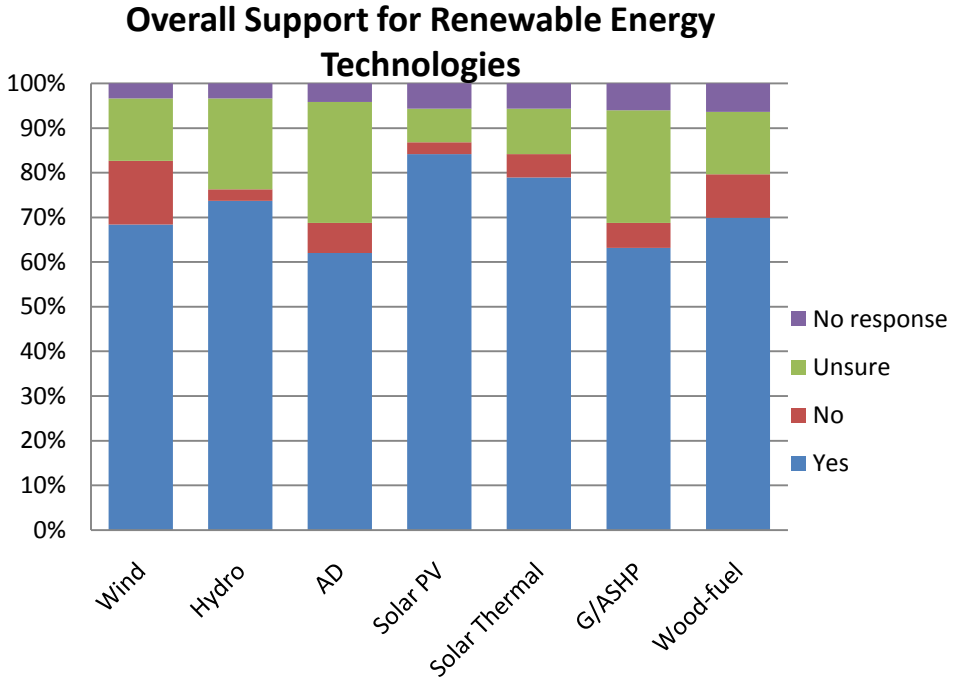
As part of the Sustainable Energy Eden project, a survey was undertaken which took into account the views of young people, householders and businesses from the area. The response to the survey was very positive and completed surveys were returned by a total of 134 young people, 108 householders and 24 businesses from within the Heart of Eden area.

Chart 1: Sustainable Energy Eden Questionnaire – Response Rates



For purposes of clarity, the analysis of the survey results that follows has been split into the three groups in the chart above.

Over 260 completed questionnaires were returned and they all show an overwhelming support for renewables. The following chart is a composite summary:



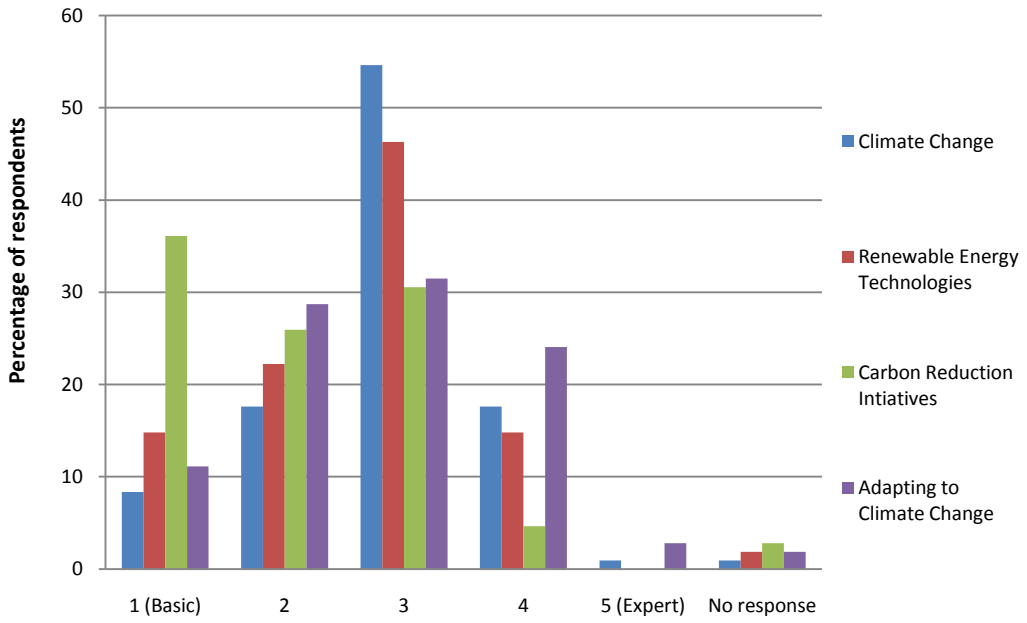
The survey shows outstanding, majority support for all types of renewables. The relatively lower support for Anaerobic Digestion was identified within the survey due to lack of knowledge, rather than lack of support. Importantly, less than 10% of the overall replies were not in favour of renewables.

Young People Survey Results

Young people in Eden were first asked to assess their current level of knowledge and understanding about issues related to climate change, renewable technology, carbon reduction initiatives and adaptation to climate change.

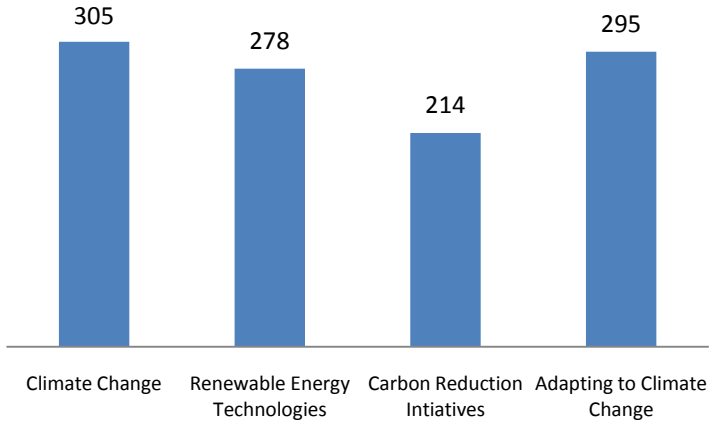
Chart 2 below shows that, amongst the young people taking part in the survey, the level of knowledge and understanding was greatest in relation to the broad issue of climate change generally, closely followed by the more specific issue regarding adaptation to climate change. Knowledge and understanding amongst respondents was lowest in relation to the issue of carbon reduction initiatives (with 36% claiming only basic knowledge).

Chart 2: Awareness of issues relating to climate change and renewables amongst young people in the Heart of Eden area



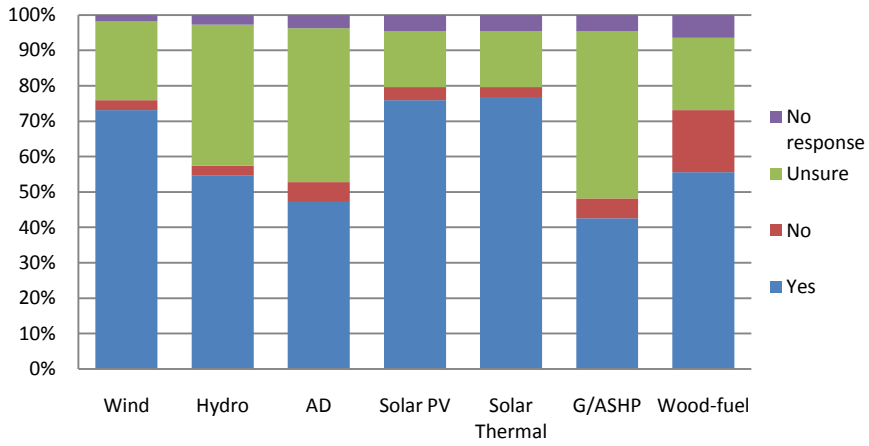
To better illustrate the levels of knowledge and understanding about the four issues, we have computed a metric for overall knowledge of the issues based on a simple multiplication of degree of knowledge (1-5) times the number of respondents in each knowledge band.
Out of a possible maximum score of 540 (108 respondents x 5), awareness of "climate change" scored highest (305) followed by "adapting to climate change" (295). Awareness of "Carbon reduction initiatives" was lowest (214). Awareness of "Renewable Energy Technologies" scored 278.

Chart 3: Overall awareness of the issues amongst young people



The survey went on to ask about the level of support for various renewable energy technologies. This was a question that was also asked in the household and business surveys and the results shown below should be considered in conjunction with the results from those completed questionnaires.

Chart 4: Young Person Support for Renewable Energy Technologies

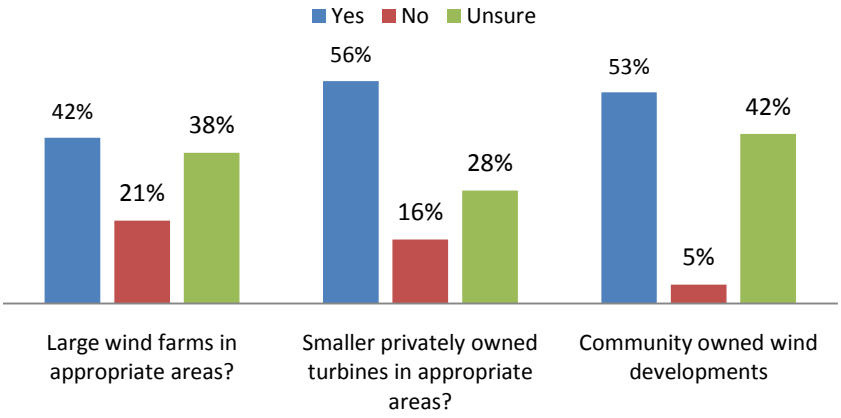


As chart four clearly shows, support for solar PV is high amongst young people with 76% in support, with support for solar thermal similarly strong with 77% in favour. Support for Wind generation is also high amongst young people, with 73% in support and only 3% against. Support for hydro (55%), ground and air source heat pumps (43%) and anaerobic digestion plants (47%) was much lower. Nevertheless, the actual number of people expressly against these forms of renewable technology was low, with the low proportion of people in favour owing to a large percentage of respondents who were unsure about these forms of energy generation. This suggests that the level of understanding about these forms of renewable energy is much less extensive with between 40% and 47% of respondents unsure about whether they are supportive of such technologies.

Respondents were also asked about their opinions on the form that any of these technologies should take if used as part of the energy generation mix in the Heart of Eden area. With regard to wind generation, the survey asked if respondents were supportive of large wind farms, smaller privately owned turbines and also community owned developments. The results can be seen in chart 5.

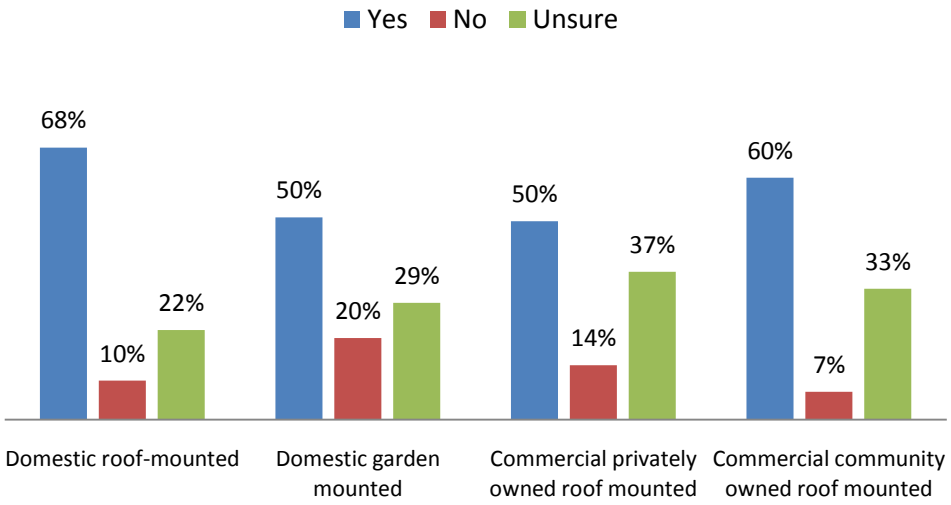
What the chart most clearly indicates is a preference for smaller or community owned wind turbines, with over half of respondents supporting these types of development. Interestingly, only 5% of respondents said that they were not in favour of community owned turbines, however the high percentage of respondents that were unsure about whether they were in favour of community ownership (42%) suggests that more could be done about educating respondents about the merits of such a scheme. The same could be said about large turbines, with a high percentage of uncertainty also evident amongst respondents (38%).

Chart 5: Support for various wind power amongst young people



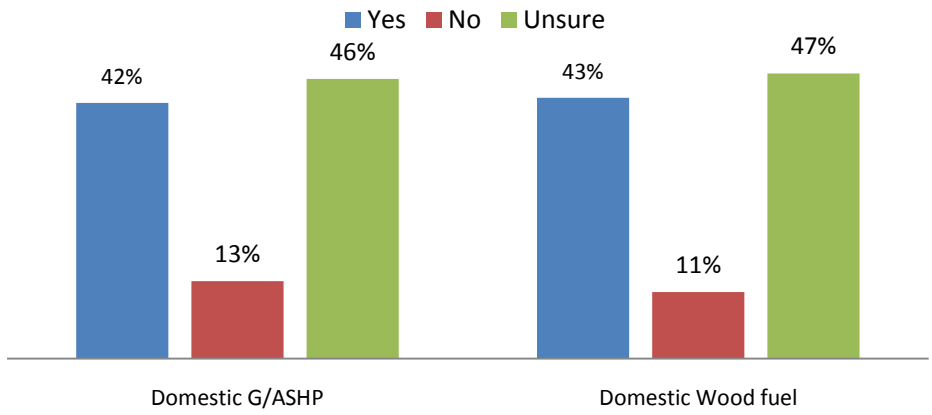
Support was positive for Solar PV in all its forms whether domestic or commercial, or privately or community owned. However it is evident that domestic roof mounted systems were the most popular amongst respondents. As with wind power, there is a higher degree of uncertainty regarding whether respondents were in favour or otherwise about community schemes; perhaps as these types of schemes are less recognisable to respondents than domestic installations.

Chart 6: Support for Solar PV power amongst young people



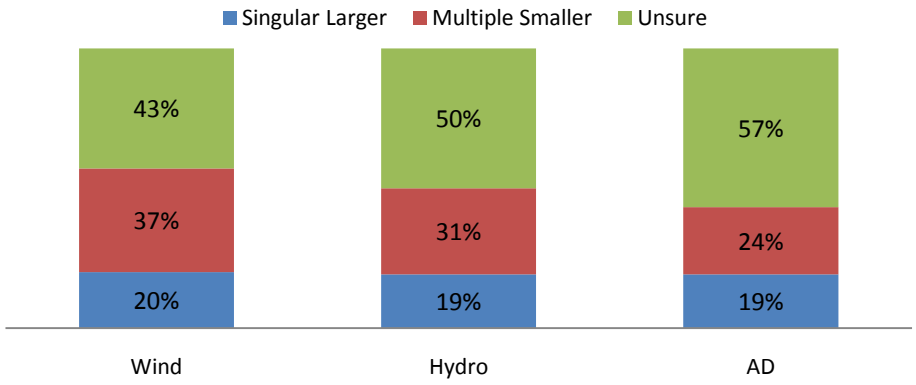
Amongst domestic schemes, roof mounted installations were preferable to garden mounted ones by quite a large margin, with 1/5th of respondents not in favour of garden mounted schemes.
Survey respondents were also asked about the level of support for domestic Ground or Air Source Heat Pumps (G/ASHP) and also domestic wood-fuel as part of the energy mix. The most striking feature of the responses to these questions was the high proportion of uncertainty, with almost half of respondents unsure about the opinion on the matter.

Chart 7: Support for G/ASHP and Wood-fuel amongst young people



When survey participants were asked about whether they would prefer multiple smaller or singular larger versions of various types of renewable installations, the results were as follows:

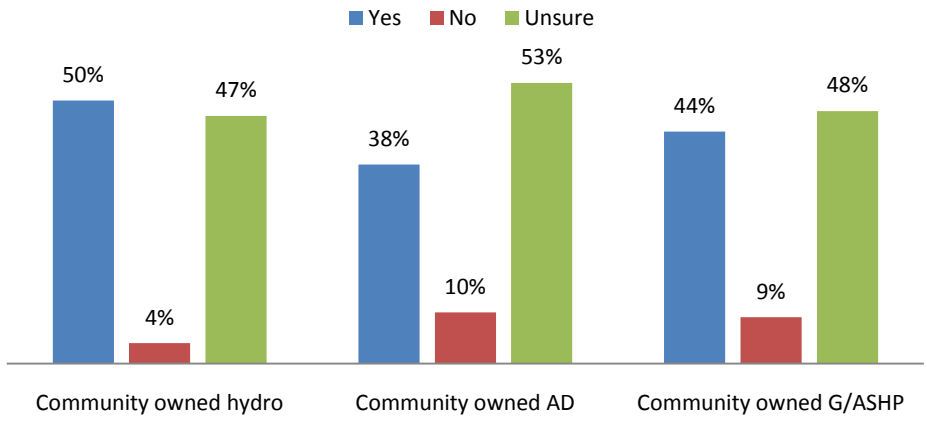
Chart 8: Preference for large or small installations by technology



Smaller installations were obviously more favoured by respondents, with almost double the number of people in favour of smaller wind turbines versus larger ones. However the distinction between larger and smaller anaerobic digestion plants was far less clear. Nonetheless, the level of uncertainty amongst respondents is, once again, the most significant observation.

Finally, respondents were asked about their level of support for community owned hydro, anaerobic digestion and G/ASHP schemes. Perhaps unsurprisingly the level of uncertainty was, once again, a significant factor. However, amongst those who had an opinion on the matter, the response was overwhelmingly in favour of community owned schemes. These results tend to suggest that respondents were in favour of community ownership *per se*, rather than any specific degree of support for any particular renewable technology.

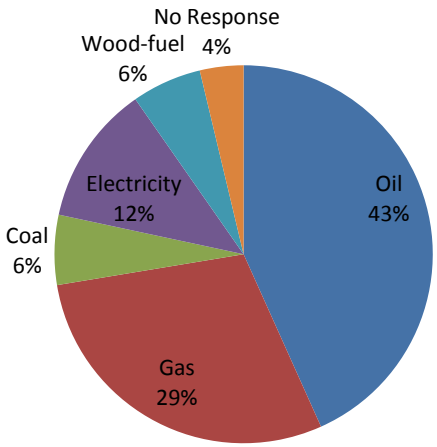
Chart 9: Support for community owned schemes amongst young people.



Household Survey Results

Although householders were asked a slightly different set of questions to young people many of the questions were identical. The householder results are provided below

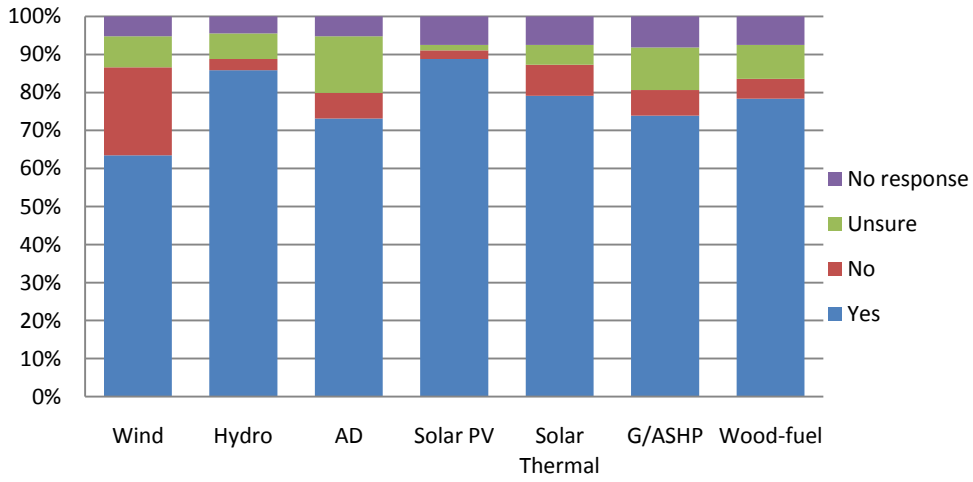
Chart 10: Current methods of home heating in Heart of Eden



Owing to the largely rural nature of the Heart of Eden area, a large percentage of houses were heated by oil-fired central heating. This is not surprising given the financial challenges associated with connecting a sparsely populated area to the national Gas network. Gas heating accounted for less than a third of households overall, however this figure rose to 85% of respondents from Appleby. Other methods of heating, including electricity accounted for over a quarter of households.

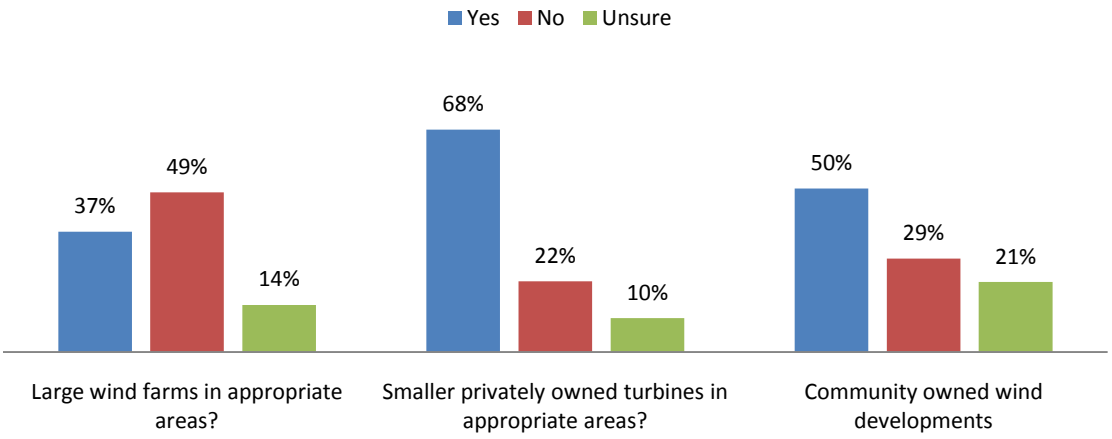
As with young people, householders were asked about whether they were in favour of various types of renewable technology. The results are shown in chart 11 below. Overall, the support for renewable energy technologies was overwhelmingly positive over 85% of respondents were in favour of Solar PV and Hydro generation and around 80% in favour of Solar Thermal and Wood-fuel. Only Wind generation had a significant number of people that were not in favour with 23% against this type of renewable energy generation. Levels of uncertainty were highest for AD and Ground/Air Source Heat Pumps, with 15% and 11% respectively unsure about whether or not they were in favour of these technologies.

Chart 11: Support for Renewable Energy Technologies amongst householders



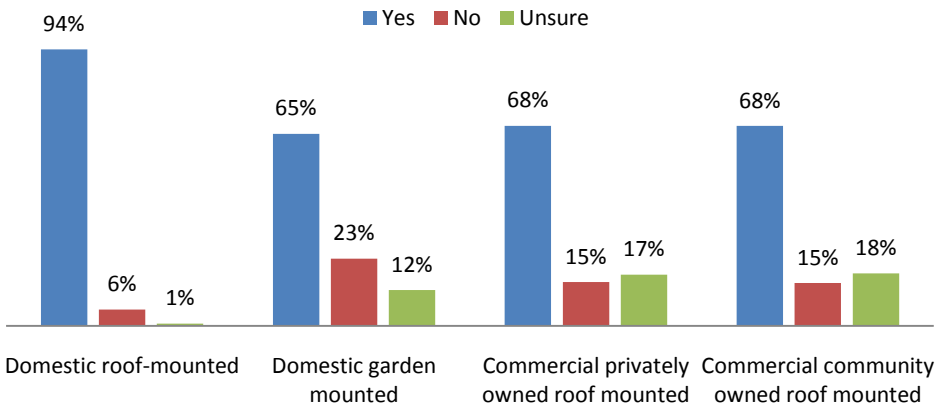
The chart clearly indicates a preference for smaller or community owned wind turbines as opposed to larger installations, with almost half of respondents not in favour of the latter. Over two thirds of respondents would favour smaller privately owned turbines. 50% of respondents were in favour of community owned developments; however there was also a large proportion of respondents (21%) who were unsure of their opinion regarding such installations.

Chart 12: Support for various types of wind power amongst householders



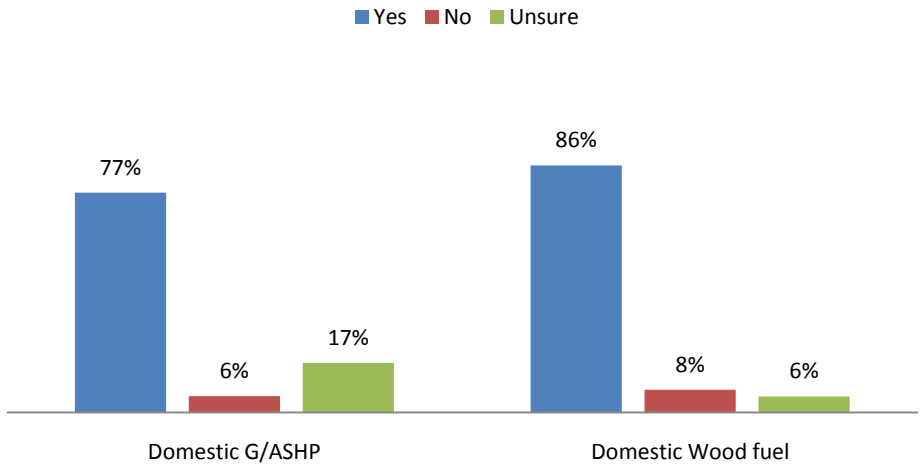
As with the results from young people, support amongst householders for Solar PV was very positive in all its forms whether domestic or commercial, privately or community owned. However it is evident that domestic roof mounted systems were the most popular amongst respondents with 94% in favour and only 6% against. As with wind power, there is a higher degree of uncertainty regarding whether respondents were in favour or otherwise about community schemes; perhaps as these types of schemes are less recognisable to respondents than domestic installations. The numbers of people not in support of this type of renewable generation were most in evident with regard to domestic garden mounted systems (23% against).

Chart 13: Support for various types of Solar PV power amongst householders



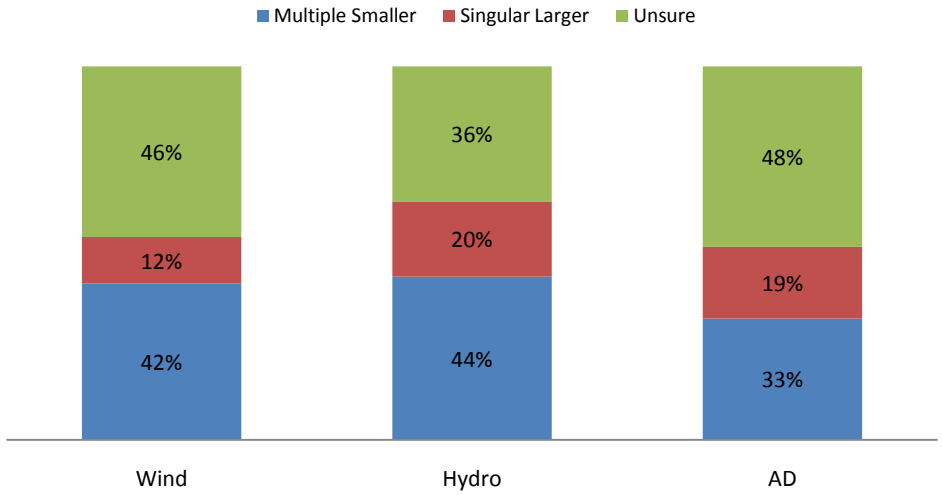
Householders were also asked about the level of support for domestic Ground or Air Source Heat Pumps (G/ASHP) and also domestic wood-fuel as part of the energy mix. Compared with the results from the young person survey the degree of support for these technologies was significantly higher and the level of uncertainty over the merits of these forms of generation far less evident, particularly with regard to wood fuel.

Chart 14: Support for G/ASHP and Wood-fuel amongst householders



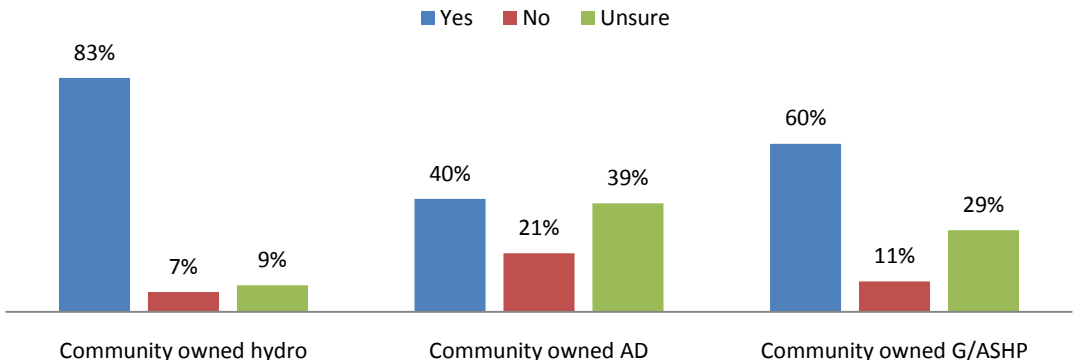
Householder opinion was sought on whether multiple smaller or singular larger versions of various types of renewable installations were preferable and the results can be seen in chart 15. As was the case with the response to the young person survey, smaller installations were more popular. With regard to wind, 42% were in favour of smaller installation versus only 12% in favour of larger ones, however perhaps the most surprising figure was the percentage of people with no firm opinion on the matter (46%). The results in relation to hydro technology were similar with 44% in favour of small installation versus 20% in favour of larger ones, and 36% unsure either way. With regards to anaerobic digestion the result was closer with 33% in favour of large installation versus 19% for smaller ones. However, almost half of the respondents (48%) were unsure about whether they would prefer smaller or larger AD installations.

Chart 15: Householder preference for large or small installations by technology



Householders were also asked about their level of support for community owned hydro, anaerobic digestion and G/ASHP schemes. Chart 16 (below) clearly shows a strong level of support for community owned hydro schemes with 83% in favour of such installations. Support for community owned G/ASHP schemes was also strong with 60% in favour versus only 11% not in favour. Support for community owned AD was less clear with almost two fifths unsure about the matter; nevertheless the result was still a positive one, with almost double the number of respondents in favour than against

Chart 16: Support for community owned schemes amongst householders

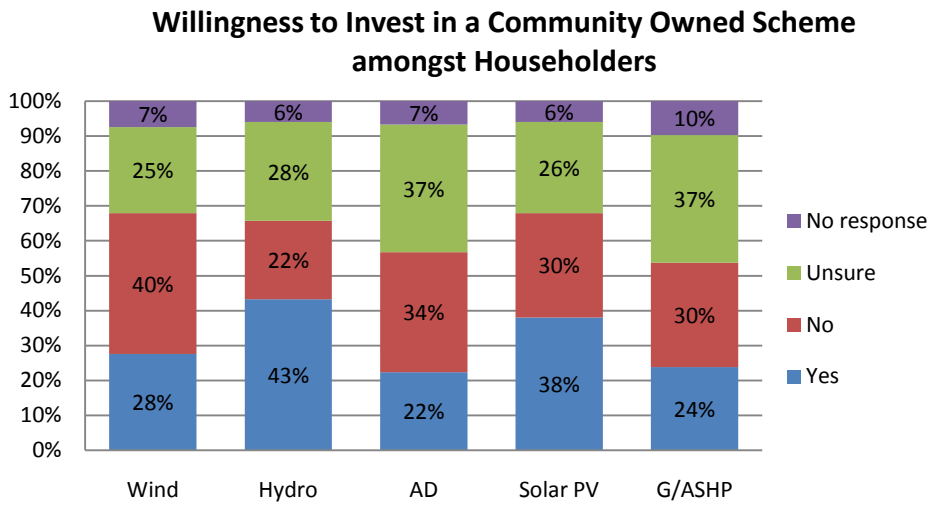


Finally, householders were asked whether they would be prepared to invest in community owned schemes in return for an annual dividend. This provides a strong idea as to the degree of support in the range of available renewable technologies and provides a sense of whether respondents would be prepared to "put their money where their mouth is" to actually invest in community owned renewables scheme.

Chart 17 below shows, by technology the results and unsurprisingly, given the results above, hydro and solar PV come out tops with 43% and 38% of respondents stating that they would willing to invest their own money in a community scheme. However for wind, AD and G/ASHP the proportions of people willing to invest were outweighed by those who would not be willing to invest in such schemes.

Nevertheless there is also a large proportion of respondents who are not yet sure whether they would be willing to invest or not. This suggests that there is scope for more work to be done as people are not in possession of sufficient information about the financial implications associated with community ownership.

Chart 17: Householder's willingness to invest in community renewable scheme



Business Survey Results

Business owners/managers were also consulted as part of this study and were asked a very similar set of questions to households. The charts that follow are the equivalent of the householder charts 11-17 above.

Chart 18 below shows the results from the level of support amongst businesses for various types of renewable energy generation. Overall, results are overwhelmingly positive (more so even than the householder or young people results) with over 90% of respondents in favour of Hydro, Solar PV and G/ASHP generation and over 85% in favour of Solar Thermal and Wood-fuel. Even wind generation received strong support with 75% in favour and only 17% against. AD received the lowest level of support from business owners with only 67% in favour (still a very positive result) 13% against and 21% unsure either way.

Chart 18: Support for Renewable Energy Technologies amongst businesses

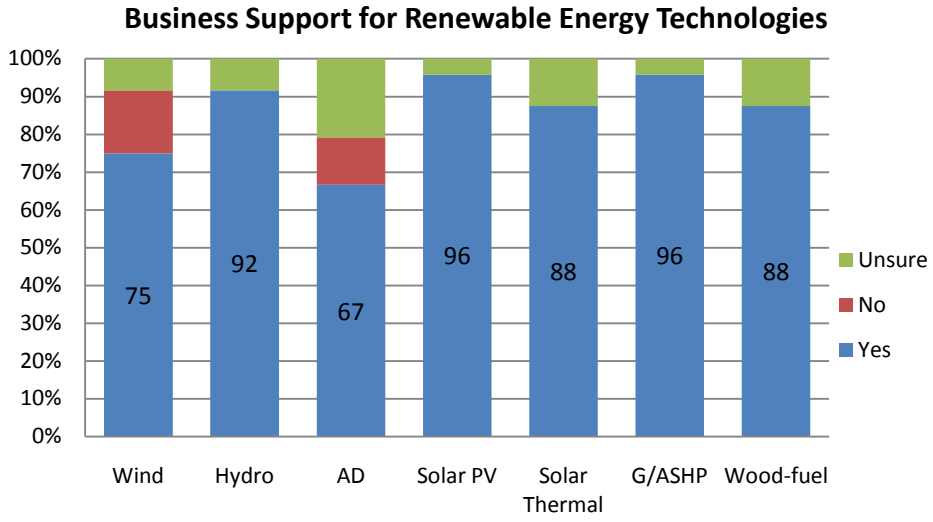
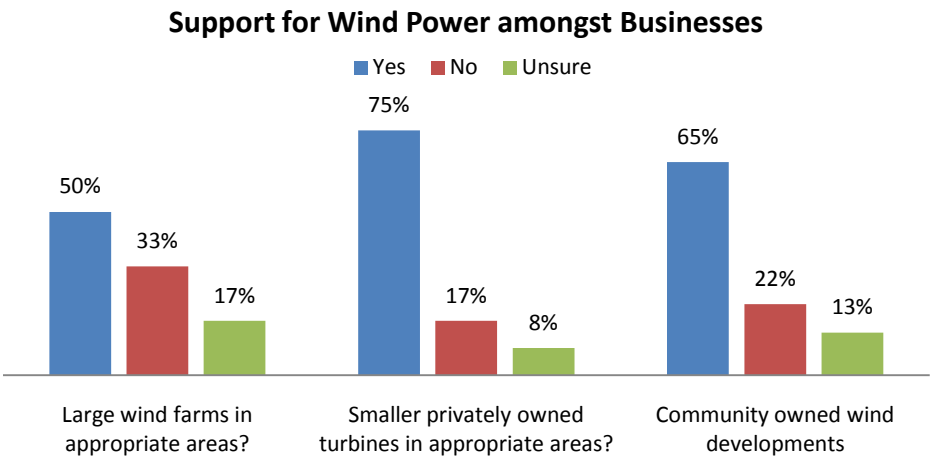


Chart 19 shows the response from business owners as to whether wind should be used as part of the renewable energy mix. Reflecting the results from the chart above, most respondents were in favour of wind being used but once again there was a clear preference amongst respondents for smaller schemes as opposed to larger ones. Once again, support for community ownership was also evident, with 65% of respondents in favour of such a scheme.

Chart 19: Support for various types of wind power amongst businesses



As with the results from young people and householders, support for Solar PV was very positive in all its forms whether domestic or commercial, privately or community owned. Again, domestic roof mounted systems were the most popular amongst respondents with 92% in favour and only 4% against.

Chart 20: Support for various types of Solar PV power amongst businesses

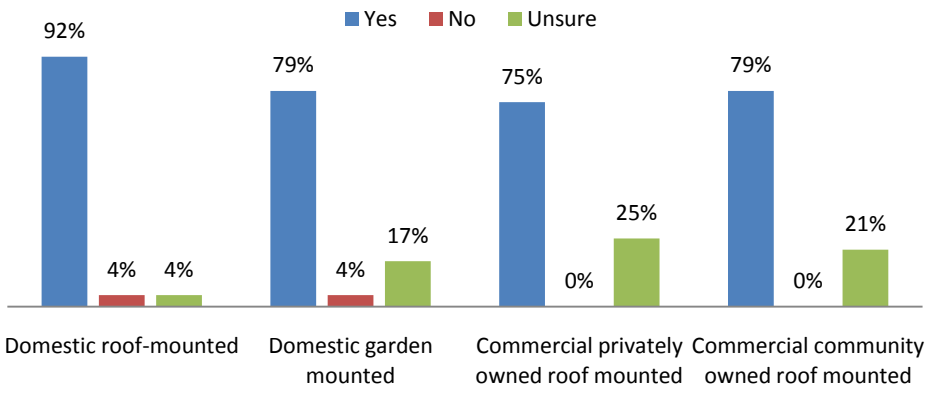


Chart 21: Support for G/ASHP and Wood-fuel amongst businesses

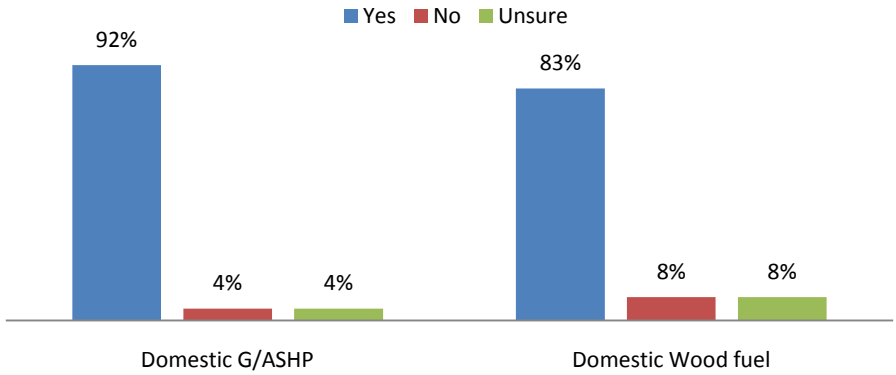
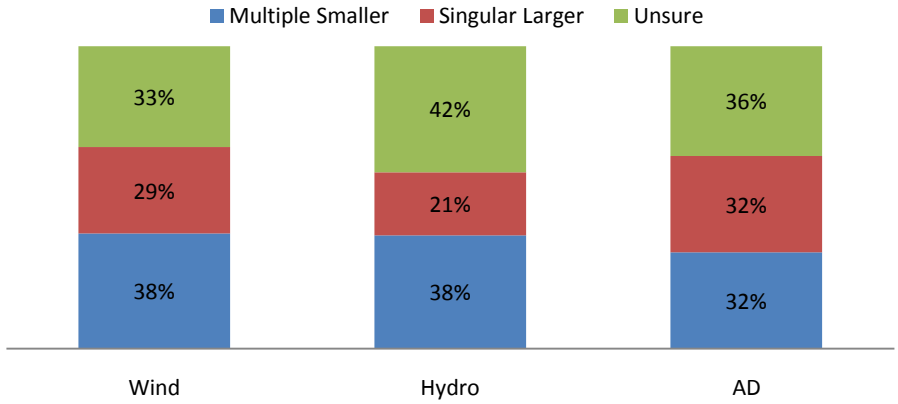


Chart 21 (above) shows the level of support amongst business owners for domestic G/ASHP and wood fuel use. Clearly, there is very strong support for both of these renewable technologies with the results even more positive than those from the householder survey.

Chart 22 shows the results from business owners to the questions regarding whether they would prefer multiple smaller or singular larger installations of various types of renewable energy installation. As was the case with both the young people and householder survey, smaller installations were generally more popular, however the margin of victory over larger installations was, in this instance, less significant. Indeed, for anaerobic digestion the results were the same with 32% of respondents favouring small installations and 32% favouring larger ones; with the remaining 36% as yet undecided over the matter.

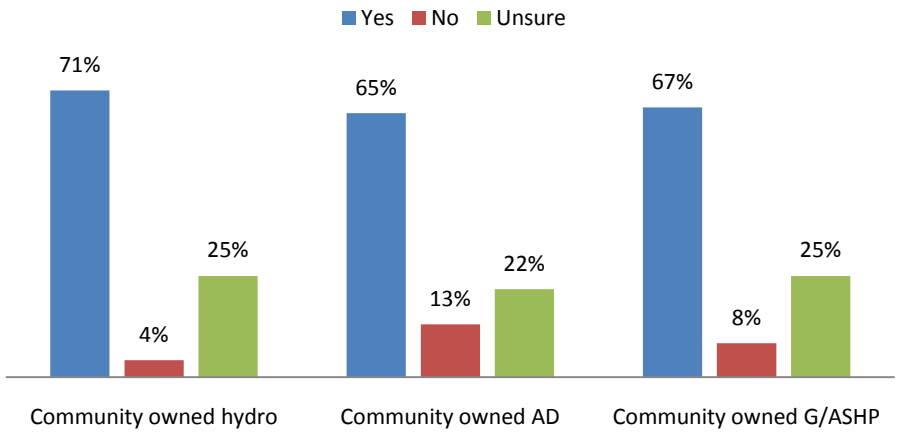
Again, as with the results from the other two survey groups, the level of uncertainty amongst respondents was most pronounced in relation to these three questions.

Chart 22: Business preference for large or small installations by technology



Business owners were also asked about their level of support for community owned hydro, anaerobic digestion and G/ASHP schemes. Chart 23 (below) clearly shows a strong level of support for community owned schemes and the results are broadly similar to those from the household survey. Again, hydro came out on top with the most positive response, albeit less so than the householder results (71% in support vs 83%). The response in relation to AD, however, was more positive than that amongst householders with 65% in favour of community AD schemes compared with only 40% of householders in support. There was also far less uncertainty surrounding AD compared with the householder results (22% vs 40%). The response in relation to G/ASHP was very similar to that given by householders.

Chart 23: Support for community owned schemes amongst businesses



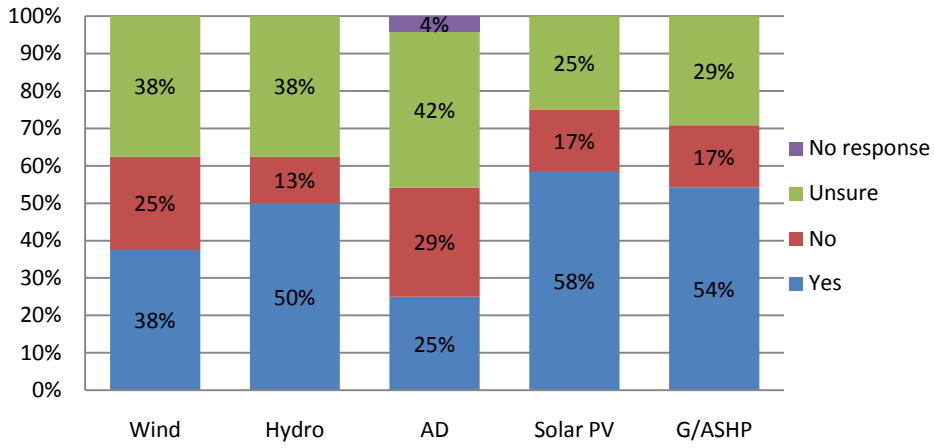
Finally, business owners were asked about whether they would be prepared to invest in community ownership schemes in return for an annual dividend. Chart 24 shows the results and once again, as with the householder results, solar PV and hydro schemes come out on top with the highest numbers of business owners willing to invest.

Overall, the results are slightly more positive than those from the householder survey, although this is perhaps only indicative of a higher propensity for risk taking amongst business owners compared with the general population.

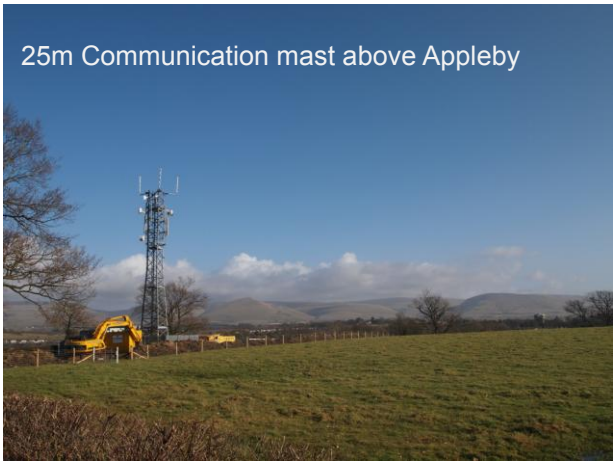
A couple of points to note are that only AD recorded fewer people willing to invest than those unwilling, however there was also the highest degree of uncertainty amongst respondents in regard to whether they would invest in this technology.

Also the degree of uncertainty was again high in respect to all the technologies, suggesting that, as with the householder survey, there is also a high degree of uncertainty about the financial opportunities offered by community investment in renewable technologies. Accordingly, as with the results from the householder survey, it is easy to conclude that there appears to be a further need to educate people about the financial implications associated with community ownership.

Chart 24: Business owner's willingness to invest in community renewable scheme



APPENDIX 7: Visualisations



A 300kW hydro scheme at Coniston


Ground mounted solar panels – 2.82kWp


2.88kWp black Solar PV Panels in Blencarn


Solar PV & Thermal
Cliburn showing the future?


2.82kWp roof installation in Dufton


Lambrigg Wind Farm
5 x 43m towers
73m to the tip
1.3MW each


6kW wind turbine at Gamblesby village hall

APPENDIX 8: Renewable Energy installations in Cumbria

FIT Installations Statistical Report – confirmations valid from 1st April 2010 – 9th June 2011

Cumbria

Technology	Domestic	Capacity (MW)	Commercial	Capacity (MW)	Industrial	Capacity (MW)	Community	Capacity (MW)	Total Installations	Capacity (MW)
Hydro	8	0.046	0	0.000	0	0.000	0	0.000	**8**	**0.046**
Micro CHP	2	0.002	0	0.000	0	0.000	0	0.000	**2**	**0.002**
Photovoltaic	348	1.008	6	0.028	0	0.000	10	0.046	**364**	**1.082**
Wind	20	0.105	0	0.000	0	0.000	4	0.016	**24**	**0.121**
Total Installed Capacity		1.161		0.028		0.000		0.061		**1.250**

Eden

Technology	Domestic	Capacity (MW)	Commercial	Capacity (MW)	Industrial	Capacity (MW)	Community	Capacity (MW)	Total Installations	Capacity (MW)
Hydro	1	0.002	0	0.000	0	0.000	0	0.000	**1**	**0.002**
Photovoltaic	66	0.196	1	0.004	0	0.000	3	0.014	**70**	**0.215**
Wind	5	0.028	0	0.000	0	0.000	1	0.006	**6**	**0.034**
Total Installed Capacity		0.226		0.004		0.000		0.020		**0.251**

Allerdale

Technology	Domestic	Capacity (MW)	Commercial	Capacity (MW)	Industrial	Capacity (MW)	Community	Capacity (MW)	Total Installations	Capacity (MW)
Hydro	2	0.007	0	0.000	0	0.000	0	0.000	**2**	**0.007**
Micro CHP	1	0.001	0	0.000	0	0.000	0	0.000	**1**	**0.001**
Photovoltaic	68	0.200	3	0.018	0	0.000	4	0.017	**75**	**0.234**
Wind	6	0.036	0	0.000	0	0.000	0	0.000	**6**	**0.036**
Total Installed Capacity		0.243		0.018		0.000		0.017		**0.278**

Barrow

Technology	Domestic	Capacity (MW)	Commercial	Capacity (MW)	Industrial	Capacity (MW)	Community	Capacity (MW)	Total Installations	Capacity (MW)
Photovoltaic	6	0.015	0	0.000	0	0.000	0	0.000	**6**	**0.015**
Total Installed Capacity		0.015		0.000		0.000		0.000		**0.015**

Copeland

Technology	Domestic	Capacity (MW)	Commercial	Capacity (MW)	Industrial	Capacity (MW)	Community	Capacity (MW)	Total Installations	Capacity (MW)
Hydro	1	0.006	0	0.000	0	0.000	0	0.000	**1**	**0.006**
Photovoltaic	39	0.126	0	0.000	0	0.000	0	0.000	**39**	**0.126**
Wind	3	0.014	0	0.000	0	0.000	2	0.007	**5**	**0.021**
Total Installed Capacity		0.145		0.000		0.000		0.007		**0.152**

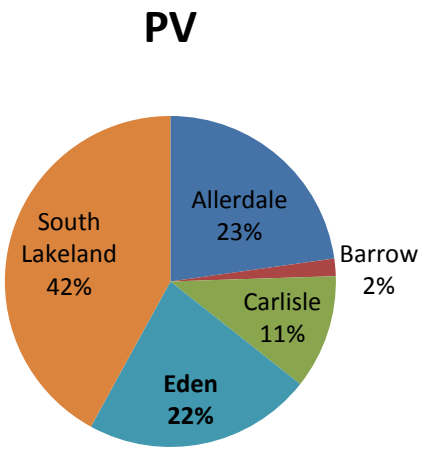
Carlisle

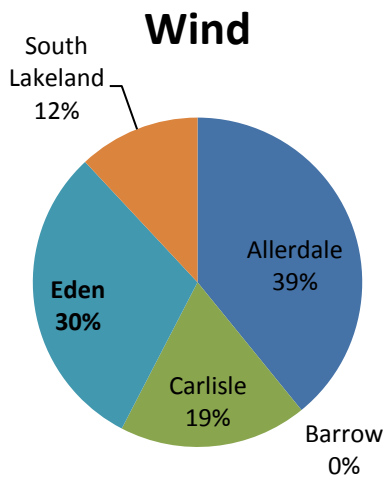
Technology	Domestic	Capacity (MW)	Commercial	Capacity (MW)	Industrial	Capacity (MW)	Community	Capacity (MW)	Total Installations	Capacity (MW)
Photovoltaic	38	0.098	1	0.003	0	0.000	0	0.000	**39**	**0.101**
Wind	3	0.017	0	0.000	0	0.000	1	0.003	**4**	**0.020**
Total Installed Capacity		0.115		0.003		0.000		0.003		**0.120**

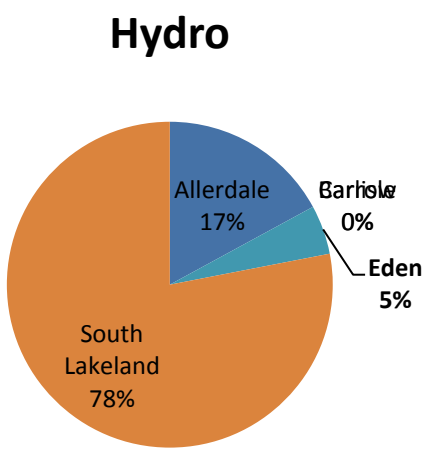
South Lakeland

Technology	Domestic	Capacity (MW)	Commercial	Capacity (MW)	Industrial	Capacity (MW)	Community	Capacity (MW)	Total Installations	Capacity (MW)
Hydro	4	0.032	0	0.000	0	0.000	0	0.000	**4**	**0.032**
Micro CHP	1	0.001	0	0.000	0	0.000	0	0.000	**1**	**0.001**
Photovoltaic	130	0.369	1	0.003	0	0.000	3	0.015	**134**	**0.388**
Wind	3	0.011	0	0.000	0	0.000	0	0.000	**3**	**0.011**
Total Installed Capacity		0.413		0.003		0.000		0.015		**0.431**

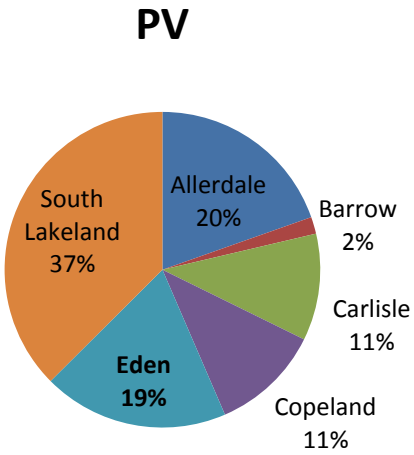
Installed Capacity

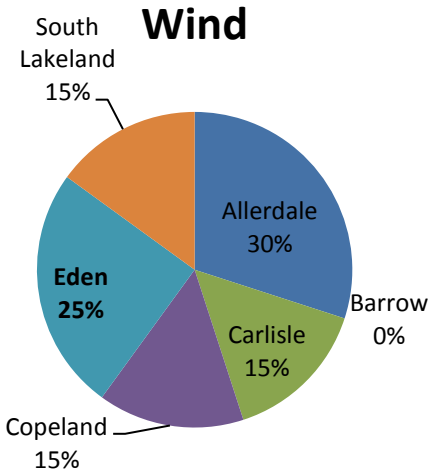


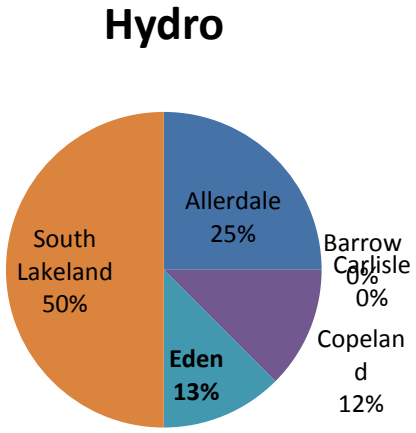




Installations







We would like to give a special thanks to:

Alan Wood	HoE Director & Milburn Parish Council
Angela Cleasby	Clerk to Temple Sowerby Parish Council
Barry Thompson	HoE Chairman & Kirby Thore Parish Council
Becky Willis	Consultant (http://www.rebeccawillis.co.uk)
Brian Morris	Cumbria County Council
Carl Bendelow	Heart of Eden Co-ordinator
Chris Pearson	HoE Director & Brandleyside Parish Council
Cllr Martin Stephenson	Cumbria County Council
Dave Hollings	Co-operative & Mutual Solutions Ltd
Derick Cotton	HoE Director & Bolton Parish Council
Gayle Bell	HoE Director & Asby Parish Council
Jenny Wain	Cumbria County Council
John Cragg	HoE Director & Long Marton Parish Council
Karen Mitchell	Encompas
Karen Morland	HoE Director & Temple Sowerby Parish Council
Keith Morgan	HoE Director & Appleby Town Council
Kevin Endres	HoE Director & Dufton Parish Council
Mike Schug	HoE Director & Murton Parish Council
Miles & Glenis Postlethwaite	Turbine Services (wind/hydro) Ltd
Neville Elstone	Cumbria Woodlands
Nicola Elliott & Staff	Appleby Tourist Information Centre
Oliver Shimell	Eden District Council
Peter Emery	Emrltd Consultants
Peter Smith	HoE Director & Bolton Parish Council
Phil Guest	HoE web site co-ordinator & H&H Reed Printers
Roger Hopcraft	Eden District Council
Stuart Frank	LocalDirect
Dent's Newsagents	Appleby
The Royal Oak	Appleby
Bridge End Newsagents	Appleby

..and the BIGGEST thank you goes to the fabulous residents in the Heart of Eden

For more information see:

www.heartofeden.co.uk

or contact:

info@heartofeden.co.uk