

Transition Belper

Energy Use and Carbon Reductions
2012 - 2020



Draft
V3

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Introduction

Transition Belper Mission Statement

Belper Transition Town is a group of local people whose purpose is to respond to the twin challenges of Peak Oil and Climate Change by developing resilience at a community level.

Our object is to facilitate the creation of an Energy Descent Action Plan, and we will achieve this by :

- **Increasing awareness and understanding**
- **Promoting change at a community and personal level**
- **Capacity building**
- **Resilience**
- **Facilitating visioning**

This will be done in the context of community inclusiveness and ownership

This report has been produced as a working and evolving document and guide for the Transition Belper – Energy Group.

Energy Descent Action Plan (EDAP)

The main objective of the Transition Belper group is to facilitate the creation an Energy Descent Action Plan for the market town of Belper. Based on the first ever EDAP, produced in Kinsale in 2005, the report will look at how Belper could navigate this uncertain time by setting out a clear vision of a lower energy future, and then identifying a clear timetable for achieving it.

The Transition Belper EDAP will look at various aspects of life, including food, transport, tourism, education and health. This report covers the area that we see as a priority, Energy, therefore forming one pillar of the Transition Belper EDAP, primarily focussing on the reduction of Belper's carbon footprint and improving our local energy resilience.

To deliver the lower energy future we will follow three key steps ;

1. Education - through the media, public events and setting up a network of Energy Expert Advisors:
 - a. Understanding the need to change
 - b. Metering, monitoring and targeting
 - c. Changing behaviour
2. Insulation – we will play an active role in schemes such as the Warm Streets and Green Deal to maximise the take up of insulation measures in the area:
 - a. Ensure our buildings do not waste energy
3. Generation – we will set up a community energy social enterprise to help increase the rate of delivery of renewable energy projects in Belper:
 - a. Develop methods of producing renewable energies in Belper
 - b. Produce local energy where practicable

Belper has unique opportunities and challenges, such as the Hydro Power opportunities from the River Derwent and the installation of renewable technologies in a World Heritage Corridor. A priority will be the challenge of eradicating fuel poverty that affects parts of the community in Belper.

To achieve the objectives of this report and get the maximum Belper community engagement required we will continue to follow the key 'Transition Steps' such as;

- Awareness Raising
- Laying the Foundations
- Forming work groups (i.e. the Energy Group)
- Develop Physical Practical Manifestations of the Project
- Facilitate the Great Re-skilling
- Build a Bridge to the Local Government
- Let it Go Where it Wants to go...
- Create and Energy Descent Action Plan

1. The area

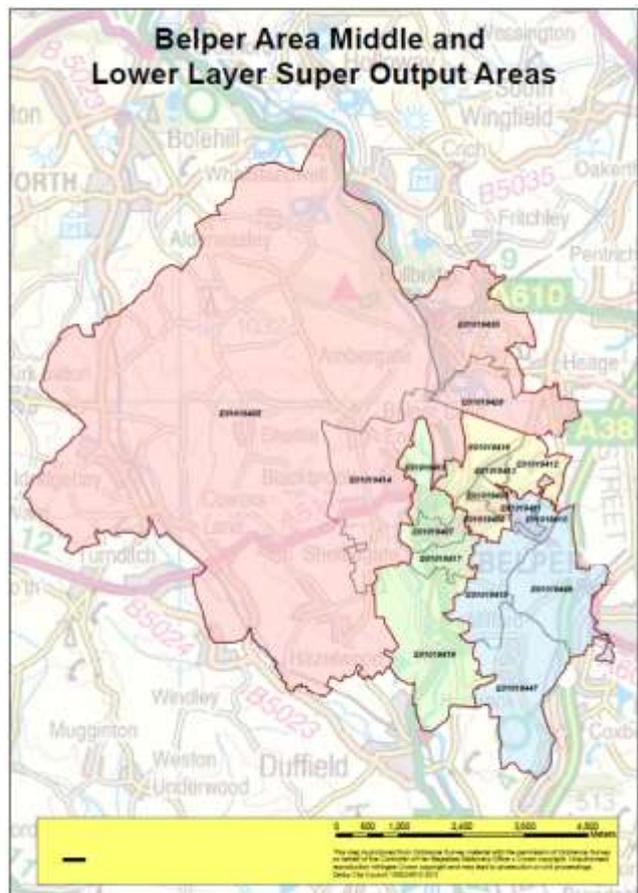
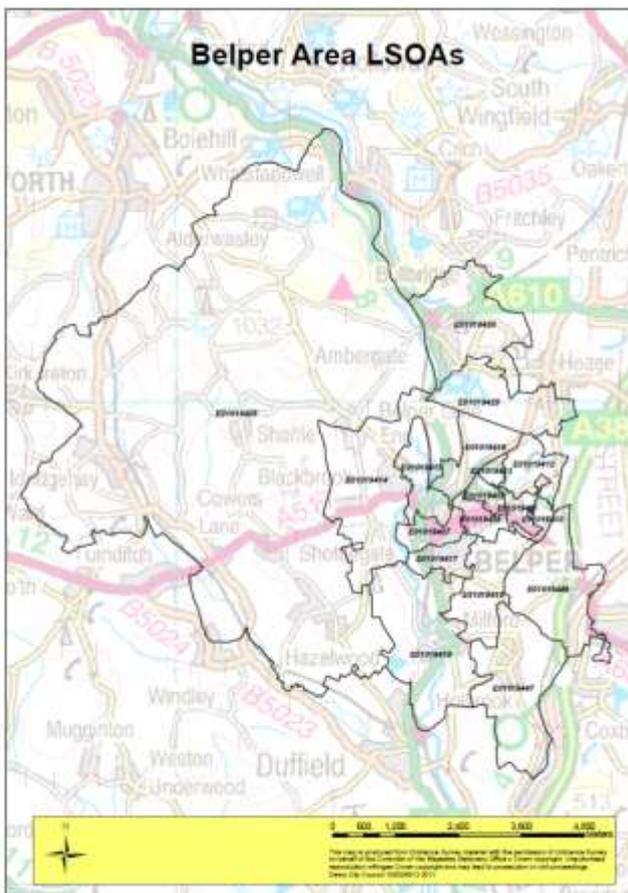
When considering the extent of the area to examine one needs to take into account the areas for which data is available. The Department for Energy and Climate Change (DECC) publish non-domestic energy consumption data by Middle Super Output Area (MSOA). We must, therefore, use the four MSOAs that cover all four Belper electoral wards; Belper Central, East, North and South. The area covered by these MSOAs also includes parts of the Alport, Heage and Ambergate and Kilburn, Denby and Holbrook wards.

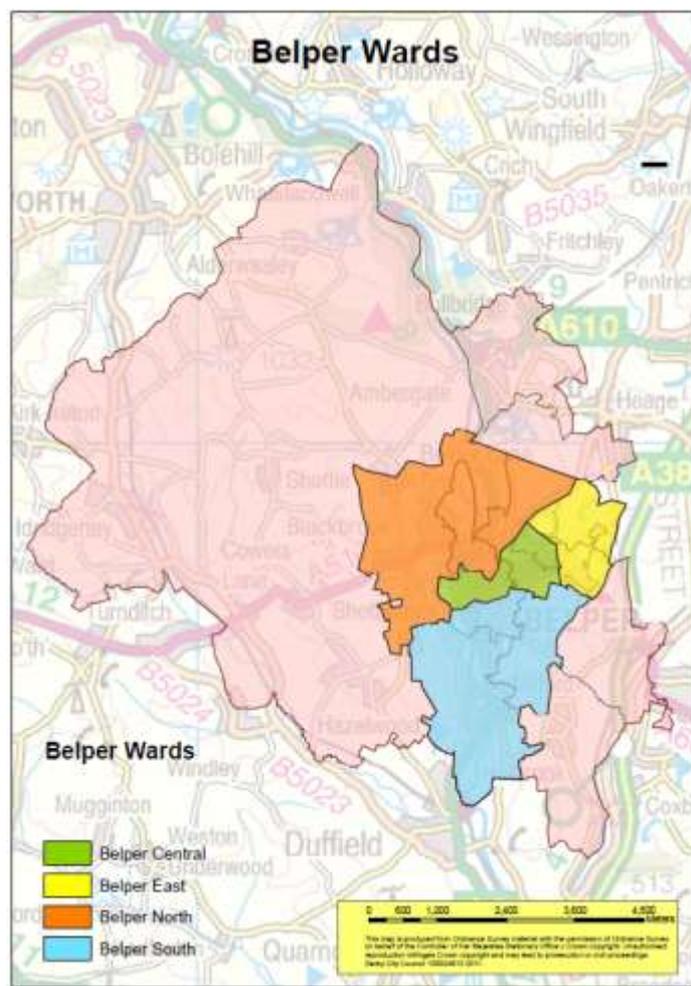
Output areas are census geographies:

- Census Output Areas – COAs are groupings of approximately 115 dwellings. They nest into LLSOAs
- Lower Layer Super Output Areas – LLSOAs are groupings of five to seven COAs. They nest into MLSOAs
- Middle Layer Super Output Areas – MLSOAs are groupings of four to six LLSOAs

The map below show:

- The LLSOAs that make up the area we are examining.
- The four MLSOAs and their component LLSOAs
- The four Belper Wards overlaid on the MLSOAs





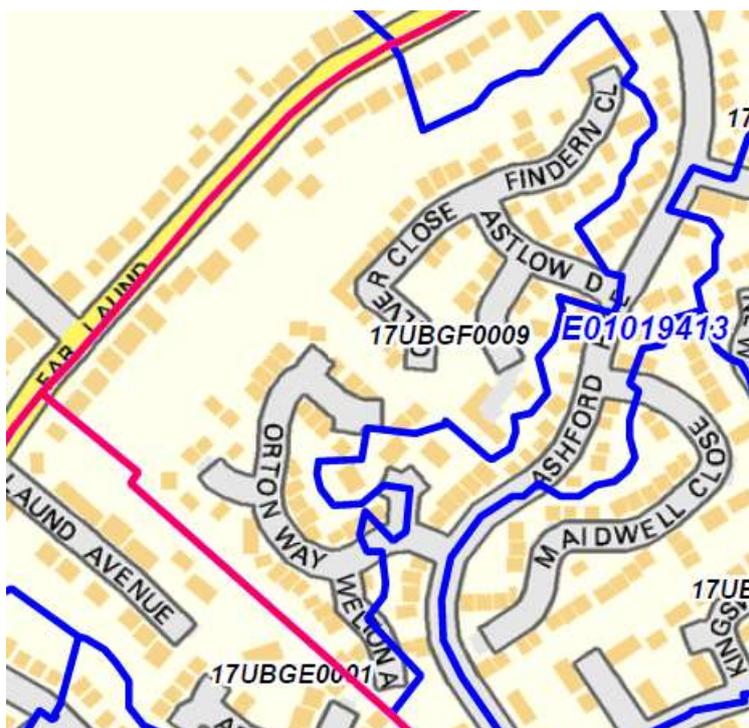
The table below details the LLSOAs in each MLSOA;

MLSOA Name	MLSOA Code	LLSOA Code	LLSOA Name
Amber Valley 007	E02004035	E01019405	Amber Valley 007A
		E01019414	Amber Valley 007B
		E01019428	Amber Valley 007C
		E01019430	Amber Valley 007D
Amber Valley 009	E02004037	E01019408	Amber Valley 009A
		E01019409	Amber Valley 009B
		E01019412	Amber Valley 009C
		E01019413	Amber Valley 009D
		E01019416	Amber Valley 009E
Amber Valley 010	E02004038	E01019407	Amber Valley 010A
		E01019415	Amber Valley 010B
		E01019417	Amber Valley 010C
		E01019419	Amber Valley 010D
Amber Valley 011	E02004039	E01019410	Amber Valley 011A
		E01019411	Amber Valley 011B
		E01019418	Amber Valley 011C
		E01019447	Amber Valley 011D
		E01019449	Amber Valley 011E

A typical lower level super output area: E01019413 – this at Far Laund and centred on Ashford Rise:



A typical census output area (17UBGF0009) within the area on the above map:



2. Baseline position

Before we are able to develop plans to reduce carbon emissions in our area we need to be fully aware of the current, or baseline, position. The latest available data from DECC is based on 2009 electricity and gas consumption. This is broken down into domestic and non-domestic use but whilst domestic use is at LSOA level, non-domestic use is only available at MSOA.

2.1 Energy Use

Published energy consumption data goes back to 2004 when the Government first published domestic electricity consumption data at MLSOA level. From 2005 both electricity and gas data has been published and in 2008 DECC began publishing lower level (LLSOA) data. For timeline comparison purposes we must therefore use MLSOA data.

Larger businesses and commercial sites with a peak load over 100kWh at any point of the day have a half hourly meter installed, e.g. Derbyshire County Council buildings, and larger industrial sites such as Bowmer & Kirkland.

This electrical consumption is only reported at Amber Valley level so we are unable to apportion the electricity consumption for large electricity consumers in the Belper area covered by this report.

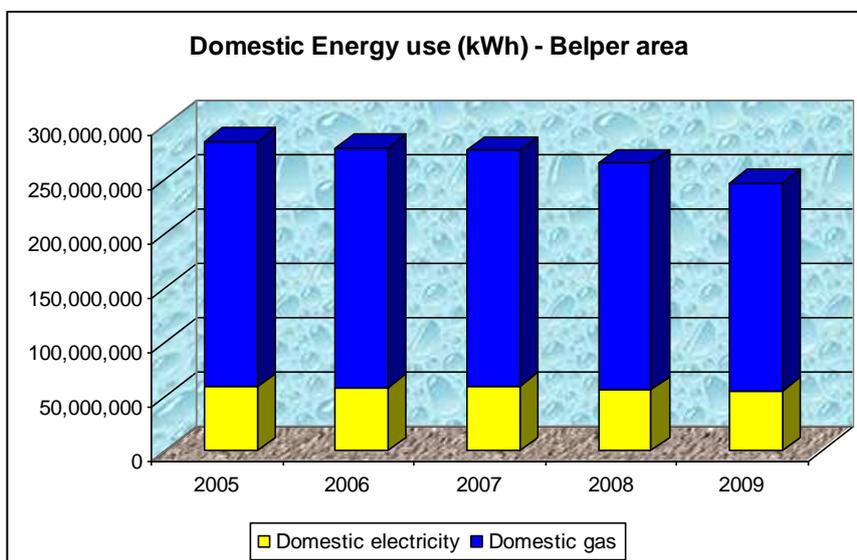
The Non-domestic energy referred to in the rest of this report refers to the non-domestic properties with standard meters and peak loads below 100kWh.

Full tables used in the production of charts below are contained in the statistical appendix to this document.

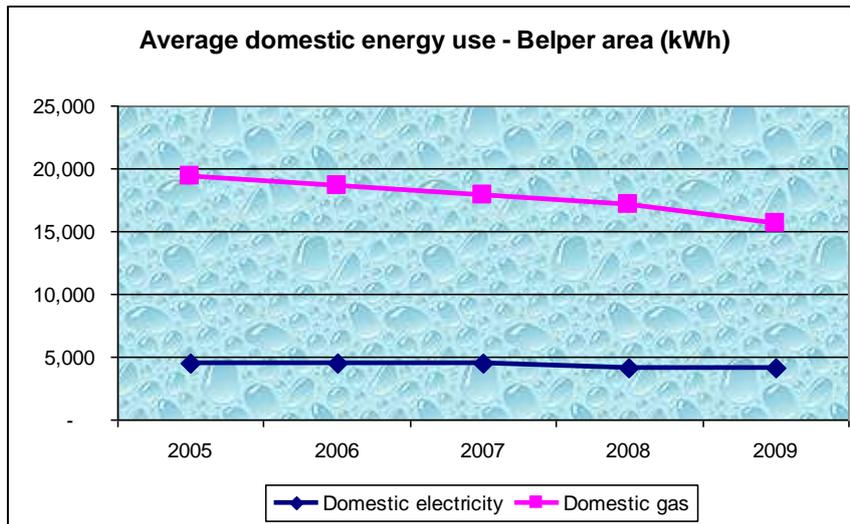
2.1.1 Domestic energy

From 2005 to 2009 domestic energy consumption fell by 13.6% from 284.9 million kWh to 246.1 million kWh in 2009 with 15.6% less gas and 5.9% less electricity being used. The period saw an additional 479 electricity meters and 602 gas meters so the proportion of properties without mains gas fell from 9.78% to 8.51%.

The average dual fuel domestic energy use fell by 17.74% from 23,936kWh to 19,691kWh; gas by 19.7% and electricity by 9.3%.



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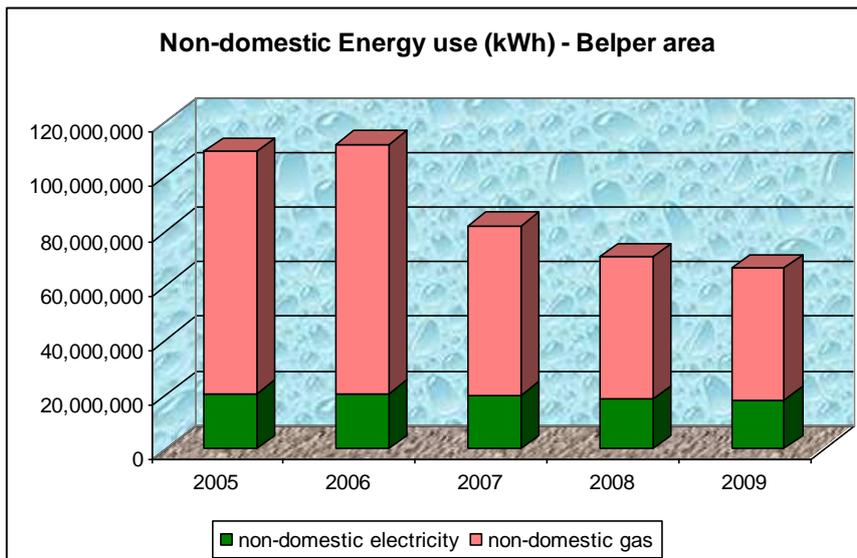


2009 domestic energy use in the four Belper wards rather than the wider area:

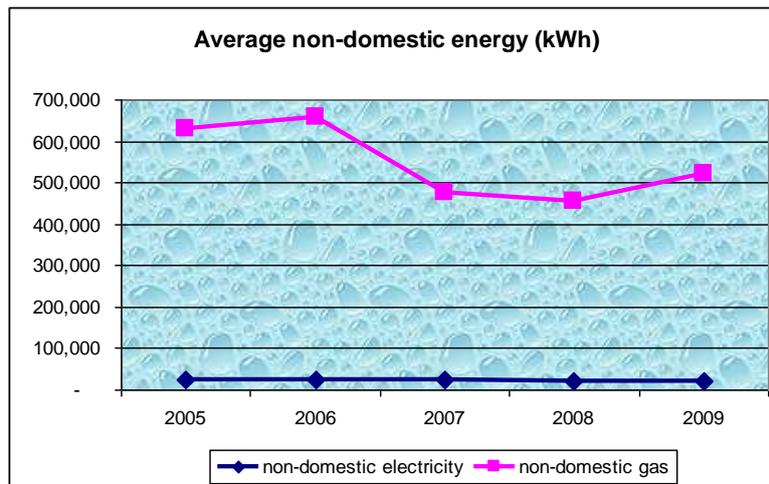
Ward	Electric meters	Electric use (kWh)	Average electricity per meter (kWh)	Gas meters	gas use (kWh)	Average gas per meter (kWh)	total domestic energy use (kWh)	Average dual fuel energy (kWh)
Belper Central	2,579	10,483,524	4,065	2,356	40,346,756	17,125	50,830,277	21,190
Belper East	2,517	10,442,207	4,149	2,361	37,965,443	16,080	48,407,652	20,229
Belper North	2,249	8,635,682	3,840	2,132	38,053,099	17,849	46,688,781	21,688
Belper South	2,573	9,965,626	3,873	2,363	37,702,678	15,955	47,668,304	19,829
Total	9,918	39,527,039	3,985	9,212	154,067,976	16,725	193,595,014	20,710

2.1.2 Non-domestic Energy

Non-domestic energy use fell by 39% in this period; gas by 45.7% and electricity by 10.3%. The number of meters, however, also fell – there are 13 fewer electricity meters and 49 fewer gas meters. Some of these reductions may be attributed to large consumers such as DEB relocating outside Belper and there may have been some re-balancing as a result of CRC (see above).



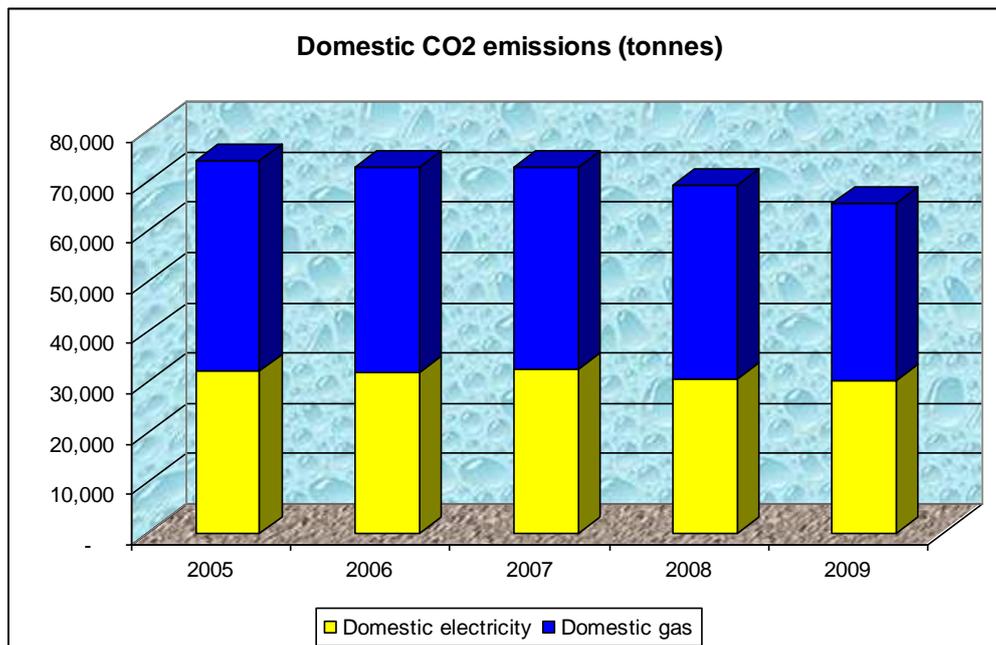
Average consumption per meter fell overall by 17.2% for gas and 8.9% for electricity although average gas use rose by 64,000 kWh in 2009 compared with 2008



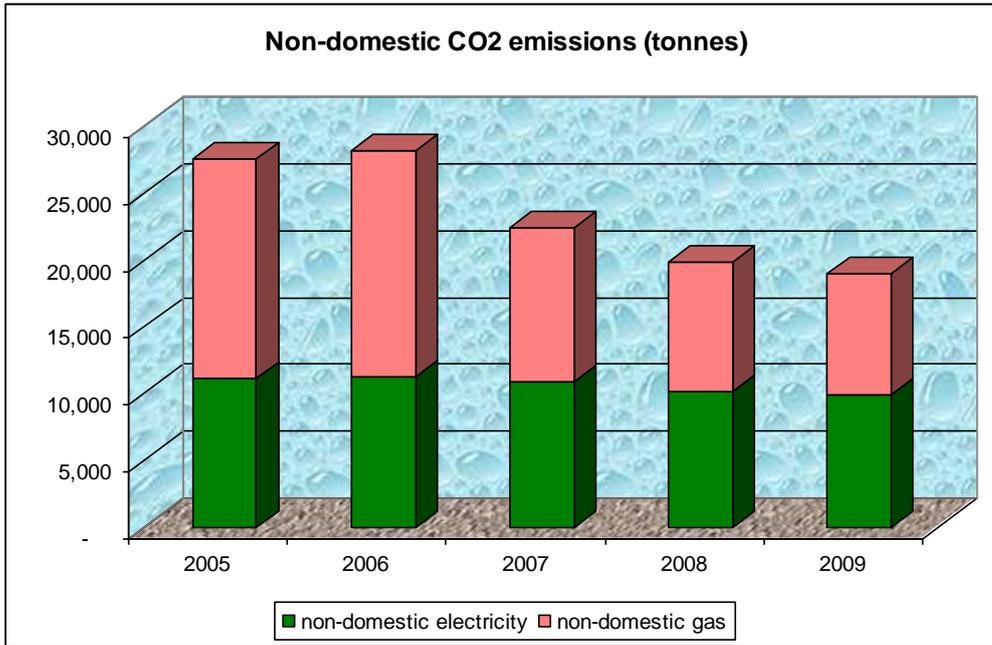
2.2 Carbon emissions

Using conversion factors of 0.54522 kg CO₂ per kWh of electricity and 0.18523 kg CO₂ per kWh of natural gas we can project total CO₂ emissions from gas and electricity use since 2005. In this period total CO₂ emissions in the Belper area fell by 16.8% from 101,440 to 84,353 tonnes.

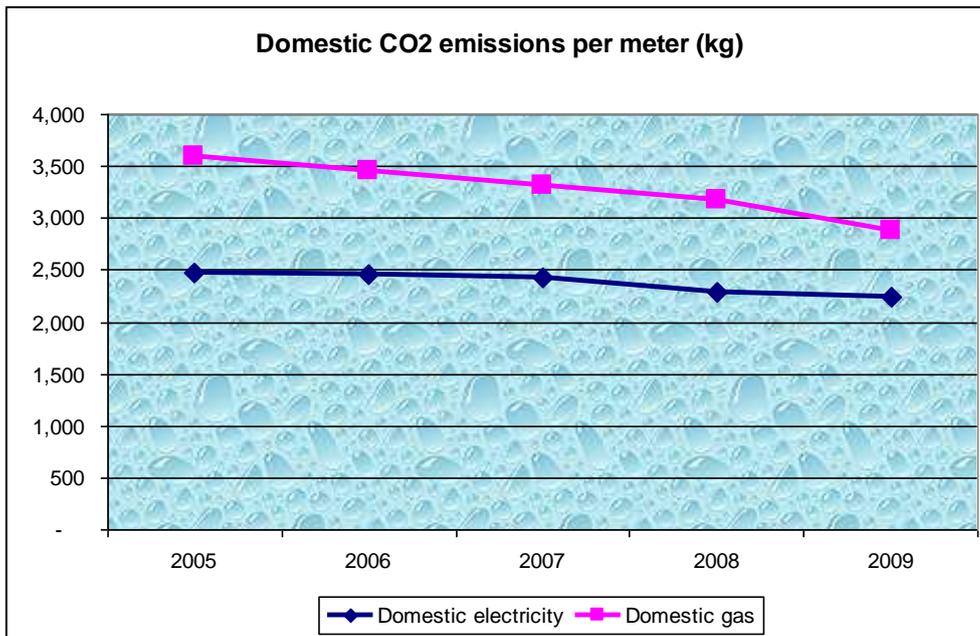
Domestic CO₂ emissions fell by 15.6% from 73,903 tonnes in 2005 to 65,482 tonnes in 2009 despite an increase in the number of households.



Non-domestic emissions fell by 31.5% but this is accompanied by a shrinking of the sector.



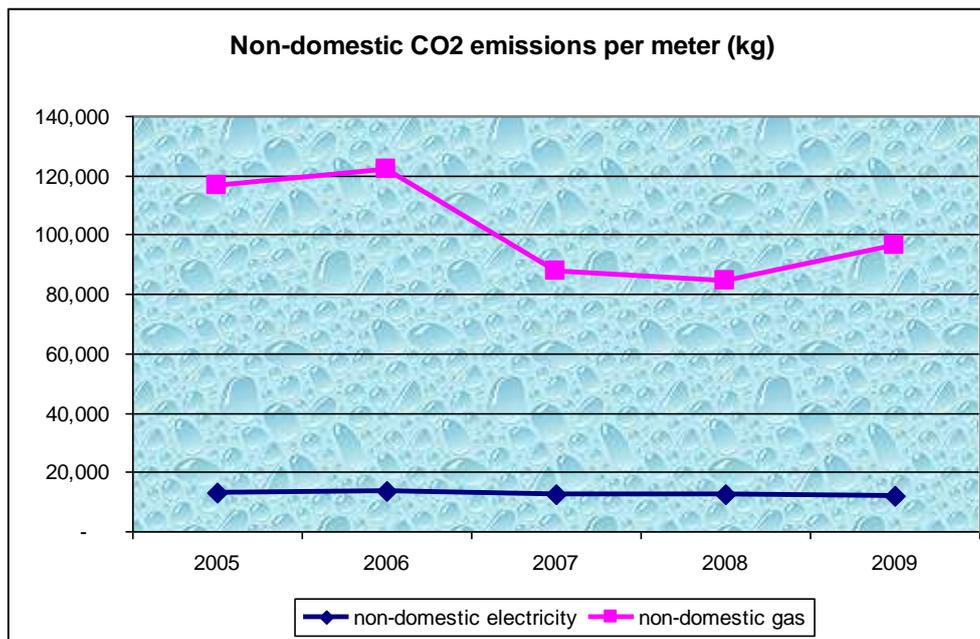
Domestic CO2 emissions per meter for the average dual fuel home fell by 15.5% from 6,070 kg (6.07 tonnes) in 2005 to 5,131 kg (5.13 tonnes) in 2009.



The 2009 average for the four Belper wards is slightly higher at 5,271 kg (5.27 tonnes):

Ward	Electric meters	CO2 emissions (kg)	Average CO2 per electric meter (kg)	Gas meters	CO2 emissions (kg)	Average CO2 per gas meter (kg)	total domestic CO2 (kg)	Average dual fuel CO2 (kg)
Belper Central	2,579	5,715,827	2,216	2,356	7,473,430	3,172	13,189,257	5,388
Belper East	2,517	5,693,300	2,262	2,361	7,032,339	2,979	12,725,639	5,240
Belper North	2,249	4,708,347	2,094	2,132	7,048,576	3,306	11,756,922	5,400
Belper South	2,573	5,433,459	2,112	2,363	6,983,667	2,955	12,417,126	5,067
Total	9,918	21,550,932	2,173	9,212	28,538,011	3,098	50,088,943	5,271

Non-domestic emissions per meter also fell – gas by 17.2% and electricity by 8.9% although there was an increase in per meter emissions from 2008 to 2009.



2.3 Energy use and carbon emissions summary - 2009

		No of meters	energy use (kWh)	average use (kWh)	CO2 emissions (kg)	Ave kg CO2 per meter (kg)
Non-domestic	electricity	876	81,354,865	92,871	44,356,299	50,635
	gas	93	48,379,938	520,214	8,961,416	96,359
Domestic	electricity	13,380	55,153,777	4,122	30,070,942	2,247
	gas	12,197	190,130,584	15,588	35,217,888	2,887
Total	non-domestic	10.62% use gas	129,734,803	148,099	53,317,715	60,865
	domestic	91.16% use gas	245,284,361	18,332	65,288,830	4,880
Total			375,019,164		237,213,090	

We can see from the above tables that, in 2009, there were some 237,213 tonnes CO2 emitted by homes and the smaller non-domestic properties in the Belper area.

Using annual data from DECC we will be able to monitor progress towards achieving set goals and targets.

References: <http://www.decc.gov.uk/en/content/cms/statistics/statistics.aspx>

2.4 Fuel Poverty

Fuel poverty – where households need to spend more than 10% of their income to adequately heat their homes – is not a pressing issue in Belper when compared with regional levels. At an average rate of 10.59% this compares well with the regional rate of 14.1%. There are, however, over a thousand households who may be facing the stark choice of whether to eat properly or to keep warm this winter.

This data – from Housing Intelligence for the East Midlands – was compiled before the price increases announced over the summer of 2011. Hi4em estimate that, when the full effects of these increases is known, there will be an additional 263 fuel poor households – a rate of 13.3%

The table below shows fuel poverty levels in the four Belper wards and the effects of an overall increase in energy prices of 15%:

Ward	H/holds (Experian)	March 2011		September 2011		Increase	
		No in or at risk of fuel poverty	% in or at risk of fuel poverty	No in or at risk of fuel poverty	% in or at risk of fuel poverty	Number	%
Belper Central	2484	342	13.77	409	16.3	67	19.5
Belper East	2483	168	6.77	205	8.3	37	22.1
Belper North	2239	252	11.26	322	14.4	70	27.7
Belper South	2564	273	10.65	369	14.5	96	35.3
Total	9770	1035	10.59	1298	13.3	263	25.4

3. Domestic Insulation levels

3.1 Using a combination of Experian household level data summarised to ward level, insulation installed data from the Energy Savings Trust's (EST) Home Energy Efficiency Database (HEED) and achievable carbon reductions by measure and house type from OFGEM's Community Energy savings Programme (CESP) calculator we can make fairly detailed projections for the four Belper wards for:

- **The number of dwellings by house type and age from Experian data.** Experian do not break their inter-war age band into pre or post 1930 but data from the Valuation Office Agency does so VOA proportions have been applied to the Experian data. Whether houses have solid or cavity walls is largely determined by age – those built before around 1930 generally having solid walls whilst those built later have cavity walls. Post 1980 houses should have cavity wall insulation and at least 150mm of loft insulation.
- **What measures have been installed locally.** The HEED database records all professionally installed measures contributing to the Government's Community Energy Savings Programme targets. It also records much dwelling and insulation detail obtained through surveys, questionnaires and the like. In all HEED has some data for around 40% of all UK homes.
- **The remaining potential for carbon emission reductions.** Using the combined data with the standard reductions as used by OFGEM to calculate whether energy suppliers are meeting their carbon reduction targets we can see what there is left to do in terms of insulation

3.2 The dwelling mix

The following tables apply only to the four Belper electoral wards

	Pre 1919	Inter war - solid walls	Inter war - cavity walls	1945 - 1980	post 1980	Total
Flats	238	42	120	126	118	643
Terrace	890	153	430	188	403	2064
Bungalow	55	66	202	502	133	958
Semi-detached	446	277	834	829	736	3123
Detached	305	142	505	759	1343	3055
Total	1934	680	2091	2404	2733	9842

3.3 The full potential as built

The table below calculates the potential carbon emission reductions and assumes:

- Solid wall = solid wall insulation, loft insulation top-up, draught proofing and boiler replacement
- Cavity wall = cavity wall insulation, loft insulation top-up, draught proofing and boiler replacement
- Post 1980 = loft insulation top up, draught proofing and boiler replacement

	Solid wall	Solid wall	Cavity wall	Cavity wall	Post 1980	Total
Flats	336,027	63,069	122,827	130,932	86,543	739,397
Terrace	1,369,735	242,998	456,131	204,352	310,226	2,583,441
Bungalow	132,678	167,031	328,079	813,505	154,450	1,595,743
Semi-detached	1,207,998	462,149	1,392,797	1,379,887	850,632	5,293,461
Detached	1,293,279	463,541	1,214,121	1,818,899	2,281,164	7,071,004
Total	4,339,716	1,398,787	3,513,955	4,347,574	3,683,015	17,283,047

The full potential for reductions from the built condition is 17,283 tonnes CO2

3.4 Known measures installed

From the HEED data we can get some idea of what has already been installed but, as this is the data least likely to be accurate, it should be borne in mind that this is a projected scenario rather than an accurate measurement:

	Solid wall insulation	Cavity wall insulation	Loft insulation	New Boiler	Draught proofing
Flats	0	281	543	369	607
Terrace	0	841	1724	1170	1951
Bungalow	0	687	808	548	907
Semi-detached	0	1972	2598	1774	2961
Detached	0	2083	2488	1652	2843
Total	0	5864	8160	5514	9269

3.5 Carbon reductions already achieved

From this we can calculate the levels of carbon reductions already achieved in the Belper area from measures installed:

	Solid wall insulation	Cavity wall insulation	Loft insulation	New Boiler	Draught proofing	Total
Flats	0	63,218	63,049	218,506	34,330	379,103
Terrace	0	207,858	111,431	768,172	139,006	1,226,466
Bungalow	0	276,293	118,238	542,541	65,724	1,002,796
Semi-detached	0	931,300	220,979	1,782,201	271,316	3,205,797
Detached	0	1,676,073	287,895	2,364,994	321,990	4,650,951
Total	0	3,154,741	801,592	5,676,414	832,367	10,465,113

Total CO2 reduction from installed measures (kg) 10,465,113

Total CO2 reduction from installed measures (tonnes) 10,465.1

Revised potential kg CO2 reduction 6,817,934

Revised potential tonnes CO2 reduction 6,817.9

3.6 Potential remaining measures

When we deduct what has already been achieved from the original built potential we can see what there is left to do:

	Solid wall insulation	Cavity wall insulation	Loft insulation	New Boiler	Draught proofing
Flats	280	83	100	274	37
Terrace	1043	180	340	894	113
Bungalow	121	150	149	409	51
Semi-detached	723	428	525	1349	161
Detached	447	524	567	1402	211
Total	2614	1364	1682	4328	573

A full breakdown of these tables by house type and number of bedrooms is available in the statistical appendix.

3.7 How much CO₂e can be saved by insulating?

The table below lists typical reduction figures for a range of measures and house types:

Measure	Annual CO ₂ e reduction per measure (kg)*				
	Loft Insulation (top-up)	Cavity Wall Insulation	Solid Wall Insulation	Draught-proofing (inc double glazing)	Replace Boiler
Flat, 1 bed	78	183	581	41	476
Flat, 2 bed	113	220	700	56	586
Flat, 3 bed	165	266	845	76	735
Mid terrace, 2 bed	58	233	728	66	617
Mid terrace, 3 bed	73	261	815	79	707
Det bungalow, 2 bed	134	385	1,233	68	935
Det bungalow, 3 bed	156	415	1,330	76	1,031
Det bungalow, 4 bed	180	446	1,429	86	1,133
Semi house, 2 bed	76	445	1,451	83	932
Semi house, 3 bed	87	479	1,560	94	1,023
Semi house, 4 bed	100	513	1,670	105	1,119
Det house, 2 bed	94	724	2,306	96	1,242
Det house, 3 bed	108	779	2,479	107	1,370
Det house, 4 bed	125	837	2,663	120	1,510
Average	80-90	400-450	1,500		

**Figures (except averages) taken from OFGEM CESP Calculator*

4. Routes to Carbon reduction

4.1 National Carbon Budget 2020 target

The Homes and Communities section of the Low Carbon Transition Plan has set an annual carbon emissions reduction target for the UK of 24 million tonnes CO₂e by 2020 based on 2008 levels (from 84 to 60 million tonnes). DECC estimate that retrofit energy efficiency measures will be required to up to 7 million homes – 27% of all UK homes – by 2020 in order to meet these targets.

DECC have outlined how these targets are expected to be met:

- **36% 'business as usual'** – this is the effects of existing policies together with technological change and the replacement of older appliances and boilers with new, energy efficient, models.
- **10% 'price impact'** – the estimated retail price of energy is set to rise significantly by 2020 as a result of energy efficiency policies; gas by 18% and electricity by 33%. Energy bills, however, are projected to rise by only 1% as a result of these policies. As the effects of insulation and other measures are outlined separately by DECC the only reasonable conclusion is that price increases are expected to act as a suppressant to energy use.
- **3% 'zero carbon homes'** – new homes built in accordance with the proposed Building Regulations Part L (2016) will be required to be zero carbon emitters achieved through a combination of improved passive insulation and the implementation of the Renewable Heat Incentive (RHI).
- **13% 'lofts and cavities'** – this is split into 2 timeframes with 11% before the end of 2012 and the remainder by the end of 2015.
- **6% 'smart meters'** – all homes will have a smart meter installed by 2020. The assumption is that, with a smart meter as reference, habits will change so that energy use will become more efficient.
- **13% 'Renewable Heat Incentive'** – this is the Government strategy to encourage the use of low carbon and renewable energy sources for the provision of heating through financial incentives.
- **19% 'major measures'** – this is basically high cost insulation to solid walls applied either internally (dry lining) or externally (cladding). 4% is due to be achieved through energy supplier carbon reduction targets via CERT and CESP schemes by the end of 2012. The remaining 15% will form the basis of the new Energy Company Obligation (ECO) to 2020. It is expected that this work will be heavily subsidised by the energy suppliers especially for homes occupied by vulnerable households and difficult to heat areas such as those with no access to mains gas.

4.2 Belper's 2020 target

The UK target reduction from 84 to 60 million tonnes CO₂e represents a 28.6% reduction in non-traded emissions. The 45% of carbon emissions generated by the supply of electricity for use in the home belongs to the 'traded sector', i.e. are part of the EU-ETS (European Union Emissions Trading System). This allows electricity generators to trade their allocated permits to generate greenhouse gasses. The remaining 55% of carbon emissions come from the burning of fossil fuels in the home and is called the 'non-traded sector'.

A 28.6% reduction in the Belper area represents 10,072 tonnes CO₂e and can be apportioned as follows:

Measure	% reduction	CO ₂ e reduction (tonnes)	Notes
Business as usual	36	3,626	= 279kg CO ₂ e or 152kWh per household
Price impact	10	1,007	= 77kg CO ₂ e or 42kWh per household
Zero carbon homes	3	302	Can only reduce the per capita emissions
Lofts and cavities	13	1,309	= All remaining uninsulated

Smart meters	6	604	= 46kg CO ₂ e or 25kWh per household
Renewable Heat Incentive	13	1,309	= renewable heating to 463 homes
Major measures	19	1,914	= Solid wall insulation to 1,276 homes

This represents what needs to be achieved if Belper is to meet a proportional share of UK targets and should be viewed as an absolute minimum. Of course, Amber Valley Borough Council, its partners and the energy suppliers will all be working to achieve this level of carbon reductions. Transition Belper has the opportunity to take a strong lead and should be able to measure success by helping to meet the above targets early and then exceeding our proportional share.

4.3 Making the change

There are three widely accepted steps to reducing carbon emissions:

- Education
- Insulation
- Generation

4.3.1 Education

By now most people should have an appreciation and understanding that using low energy light bulbs and appliances, switching off and installing insulation will save them money. As this year's huge energy prices rises hit home many will become more acutely aware of the need to reduce their energy costs and could be looking for detailed and specific advice.

There is an enormous amount of advice readily available on the internet and at the end of a telephone which, while very useful, lacks the personal advice that could be provided by a knowledgeable friend. If every household in Belper had a knowledgeable neighbour to turn to for advice the barriers of a lack of internet access or a distrust of remote telephone advice could be overcome.

Proposal:

That Transition Belper develop a network of energy expert neighbours to give free advice in their area. We should offer training and support to eventually have a network of 71 expert neighbours – one for each census output area or block of around 115 houses. This will take time but should build as follows:

- 1 or 2 expert neighbours per ward – 4 wards = 4 to 8 people
- 1 or 2 per lower super output area – 13 LSOAs = 13 to 26 people
- 1 per COA – 71 COAs

There could well be support for this framework from energy suppliers and insulation and renewable energy installers. They may be willing to undertake some training sessions and may be prepared to offer referral fees for more detailed and technical consultations leading to the installation of insulation or renewable energy.

At least one person should be fully trained and accredited as an Energy Assessor to be qualified to issue Energy Performance Certificates and carry out Green Deal assessments recommending the measures to be installed through individual household Green Deal plans. The costs associated with these more formal assessments will be paid for by the Green Deal Providers as part of the funding package.

200 assessments per year could provide at least part time employment for an assessor.

See Appendix B Energy Expert Neighbour Proposal

4.3.2 Insulation

4.3.2.1 Warm Streets

In August 2011 Amber Valley Borough Council announced a partnership with Apex Carbon Solutions to deliver low cost insulation measures to homes across the Borough. They have publicised prices of £49 for loft insulation and £99 for cavity wall insulation but a range of other options are available including solid wall insulation, insulated loft platforms and micro generation. Those aged over 70 or on low incomes may be entitled to free insulation. The 'Warm Streets' scheme will continue through 2012 and will end at the start of the Green Deal. This is undoubtedly the last chance for households who are not classed as 'vulnerable' to receive any subsidy for loft and cavity wall insulation although the Green Deal will remove the need for any 'up front' payment.

A meeting with AVBC and Apex Solutions is to be arranged to discuss the costs of other solutions, training and referral fees so that Transition Belper can be seen as partners in delivering energy efficiency in Belper.

4.3.2.2 The Green Deal

The Energy Security and Green Economy Bill is currently passing through Parliament and should receive Royal Assent later this year. It includes provision for the Green Deal which the Government believes will revolutionise the energy efficiency of UK domestic properties and small business premises.

The Green Deal involves the setting up of a national bank, the Green Bank, dedicated to the green economy, which is a world's first and which will offer loans of up to £10,000 per property for specific energy efficiency improvements. At the heart of the Government's proposal is the "Golden Rule"; the amount of the loan repayments will not exceed the savings in the cost of energy, for the same level of comfort. The Green Bank will operate from 2012 with £3 billion from the Treasury as initial capital, and borrowing powers from 2015.

In addition to the Golden Rule, the Green Bank introduces an innovative financing mechanism whereby the loan is attached to the property, not the homeowner. The loan is paid back via the energy bill, so if the consumer moves out, and therefore ceases to be the bill-payer at that property, the financial obligation does not move with them but stays with the property; the loan repayments are only made whilst the benefits are enjoyed.

In this way, Green Deal differs from existing lending – it is not a conventional loan, since the property owner isn't liable for the capital cost of the measures, and the occupier is only liable whilst they remain as the bill-payer. This is a market mechanism, funded by private capital, which it is hoped will deliver far more to consumers than a top-down Government programme.

In addition, the new Act will introduce a new Energy Company Obligation (ECO), from 2013, following on from existing ECO's which expire at the end of 2012. This obligation will be in the form of a contribution to the overall cost of the measures, and every bill-payer in the country will see an addition to their energy bill to pay for it. Details of the new ECO should be released late 2011.

Where will the work be done?

This is a cross-tenure scheme; Green Deal will be available to any property owner; social landlord, private landlord or owner-occupier. It is also proposed that, from 2015, tenants will have a right to request the efficiency measures from their landlord, who cannot reasonably refuse such request.

The new ECO will include individual targets for tackling fuel poverty in the vulnerable, low-income household sector, and the hard-to-treat property sector. With gas and electricity prices on a continuing upward trend, these sectors need to be tackled soonest, to future-proof fuel poverty reduction targets.

Who will be involved?

The process of delivering individual Green Deal plans will involve only properly accredited and quality assured players:

- **Assessors** will carry out energy audits of properties, issue EPC's (Energy Performance Certificates), recommend qualifying energy saving measures, explore and advise on options for renewable energy and offer advice on other environmental issues such as water conservation.

- **Installers** will carry out the work agreed in the individual Green Deal plan,
- **Providers** will arrange the financial package and co-ordinate the contractual and payment arrangements. Likely Green Deal providers are Energy Providers themselves; financial institutions; high street retailers (for example B&Q; Tesco; M&S) and Local Authorities,
- **Energy Companies** will take repayments from their customers' bills and make payments to Providers.

Role for Transition Belper

Under the Energy Expert Neighbour scheme outlined above there is scope for advisors to refer potential Green Deals to the accredited Green Deal Assessor to begin the process and have a full assessment carried out. There is a wider role in marketing the initiatives, incentives and subsidies available to householders and businesses and assisting them in carrying through carbon reduction plans.

4.3.3.Generation

The UK has signed up to the EU Renewable Energy Directive, which includes a UK target of 15 percent of electricity from renewables by 2020. This target is equivalent to a seven-fold increase in UK renewable energy consumption from 2008 levels: the most challenging of any EU Member State.

In the wider Belper area this is the equivalent of generating 20.5 million kWh of renewable electricity. However, in Q3 2009 6.8% of electricity generated in the UK was from renewable energy sources⁽¹⁾. Assuming this is distributed evenly we can assume that 9.3 million kWh of renewable energy is used in Belper already. This includes the existing hydro electricity generated at East Mill, Belper and at Milford.

Whilst major projects such as off-shore wind generation will contribute the greater proportion of this target it would be greatly helped by smaller community and dwelling based generation schemes. Generating 15% of the electricity used in the wider Belper area by 2020 would be a considerable achievement.

There are multiple opportunities for home owners and commercial and social enterprises to invest in renewable energy in the Belper area and to make an attractive return on their investment. There are, however, environmental, heritage and planning factors that may limit what can be achieved. These layers to consider make it difficult to clearly envision the renewable energy route to a low carbon Belper.

Proposal:

That Transition Belper produce a guide to installing renewable technologies in the World Heritage corridor that examines the barriers, costs and potential returns of all forms of renewable energy for both householders and as potential business propositions.

⁽¹⁾ Source: DECC:

http://www.decc.gov.uk/publications/basket.aspx?FilePath=Statistics%5cpublications%5ctrends%5c1_20091223094550_e_%40%40_pn150.pdf&filetype=4#basket

4.3.3.1 Solar pv

At an average rate of 75kWh per solar pv panel some 273,000 panels would need to be installed to achieve a 15% target. This is the equivalent of installing a 2kW system on 27,300 roofs and is clearly impossible. It is probably possible to install solar pv to around 20% of all dwellings but larger opportunities may arise from industrial, commercial, educational and other non-residential buildings.

Installing solar pv to 2,000 dwellings in Belper would likely generate around 6 million kWh, or just under 30% of the 15% target. 20 larger scale 20kW systems would likely generate 150,000kWh in total.

The only real barrier to the large-scale uptake of solar pv is the initial cost of installation as the economics of the Feed in Tariff (FiT) make solar pv one of the most attractive investments available. A lesser barrier may be the growing concern, following recent cases, that installation companies are miss-selling or miss representing the generation potential to overstate the potential returns.

Proposal

That Transition Belper produce a guide to solar pv that includes the steps needed to self-assess suitability for solar pv and roughly estimate the costs and returns that could be expected using local case studies wherever possible. Also to develop a recommended list of suppliers, again based on local examples but also meeting acceptable minimum standards of customer care, accuracy of estimates, workmanship and accreditation.

4.3.3.2 Hydro Electricity

Approximately 2.12 million kWh of electricity is already generated by hydro schemes at Belper's East Mill and at Milford but the River Derwent affords much greater scope for electricity generation. There is the potential, at least, to install hydro schemes at LB Plastics, Ambergate, in Belper itself and another scheme at Milford. There may also be potential at Eaton Bank, Duffield.

Climate East Midlands, in association with the Environment Agency, are currently preparing a report detailing the opportunity for hydro-electric generation in the East Midlands. This centres on the Rivers Derwent and Nene. The report will be useful in any discussions with Amber Valley Borough Council and the Environment Agency.

Transition Belper is registered as a small charity and is thus prevented from generating income from commercial activities. There is, therefore, the need for a social enterprise to conduct commercial activities for the benefit of the community and the aims of tackling climate change and reducing our reliance upon fossil fuels in the Belper area.

Proposal

That members of Transition Belper who can commit time to developing renewable energy schemes locally form a Community Interest Company limited by shares. This CIC should, in its Articles of Association, name Transition Belper as the asset-locked body specified as a potential recipient of the Company's assets as required by CIC regulations.

4.3.3.3 Other Schemes

The potential of other energy saving and renewable generation of heat and electricity should be outlined to the public in the Belper area for them to determine which other options to investigate and pursue. These should include:

- Residential scale wind generation
- Large wind turbines
- Ground source heat pumps (GSHP)
- Air source heat pumps (ASHP)
- Community Heat Schemes via biomass boilers
- Residential scale biomass boilers
- Electricity generation using anaerobic digestion
- Solar thermal
- Energy from waste

5. Community Engagement

The key to a successful transition lies in inspiring the residents of the Belper area to voice opinions, take personal action and to commit idealistically and financially to tackling climate change and reducing reliance on fossil fuels.

In engaging the community there is a need firstly to hold a series of workshops involving other community and representative organisations such as Belper Civic Forum, Belper Town Council, DVMWHS, Amber Valley Borough Council, Friends of the Earth and any other organisation with environmental, heritage or sustainability concerns.

With a fairly well agreed common approach, arrived at through these workshop sessions we will be better prepared to take the process to the wider public.

5.1 Setting out the options

In setting out the options Transition Belper should use the tools provided by the Centre for Sustainable Energy (CSE) in their PlanLoCal resource pack as well as developing a network of expert speakers to address specific issues or technologies.

A series of events needs to examine;

- **Why do we need to reduce our carbon emissions and reliance on fossil fuels?** The issues of climate change, peak oil and affordability should be examined – even if people do not believe the climate change science or are confident there are yet to be discovered reserves of oil and gas they will undoubtedly be affected by ever increasing energy prices. How much importance do people attach to these issues and what are their own priorities? What drivers do we need to tap into and harness?
- **How much electricity and gas do we consume locally?** How does this translate to carbon emissions and what can be done to reduce how much we use? How can we have more efficient, better insulated homes and reduced energy bills? What help is out there? There needs to be a particular emphasis on what can be achieved in solid walled homes and buildings where there are likely to be planning considerations such as the World Heritage Site and its buffer zone and the Belper/Milford Conservation Area. This needs to liberate people from the idea that they can't get through the red tape to do anything and offer support from Transition Belper through the processes.
- **Alternative energy** – how can the community generate its own electricity and heat? All the options need to be outlined including their physical constraints, costs, incentives, capacities and CO₂e reductions. The community should then be asked to suggest pros and cons for each and arrive at a prioritised list for further investigation and consideration.

These public events could be jointly managed and promoted in partnership with a range of complimentary organisations. The aim will be for the community to set the future agenda by deciding what is important to them and how they would like to move towards a carbon neutral future. At the same time we will be demonstrating a competency to support the community and turn their ambitions into reality – with their help.

5.2 Reaching the community

Of course, holding well prepared public meetings is pointless unless people know they are happening, there are multiple alternative sources of the data and presentations used and people are given feedback on the outcomes and actions resulting from them.

There are only three methods of reaching every house in the area:

- **Belper Express leaflet insert.** Even with a press release to the Derby Telegraph, Belper News and BBC Radio Derby we cannot be certain that it will be used. We can, however, ensure delivery to every home with a leaflet insert. For the three postcode areas – DE56 0, 1 and 2 – covering Belper, Heage, Nether Heage, Holbrook and Kilburn the rate is £15.93 per 1,000. This area includes 10,257 houses so would cost £175.23. Excluding Holbrook and Kilburn would reduce the cost to £111.51 and include 6,379 homes (3,878 homes omitted). Readership estimates are not available so it would be guesswork to speculate on how many go straight to the recycling bag.
- **All things Local.** There are three area versions delivered free to 9,000 homes per area with a total estimated readership of 67,500 people. The areas covered are Belper, Ripley and Villages. Publication is bi-monthly. We should aim to be able to contribute a relevant article in each issue, publicise our events in the diary page and include contact details in the local organisations listing and at the foot of each of our articles.
- **Leaflet delivery by hand.** For this to be a viable option we would need around 50 volunteers to deliver to 200 homes each. We need to expand our support and volunteer base whilst planning a delivery network

Other methods can reach large numbers of people and should be employed alongside media delivery to homes:

- **Web site and social networks** – including links to and from all other local networks
- **Press releases** to Derby Telegraph, Belper News, Amber Sound and BBC Radio Derby
- **Posters** in shop windows and library, supermarket and Town Council notice boards
- **Transition leaflet dispenser boxes** on shop counters and in pubs
- **Morrison's entrance stall** – the entrance to Morrison's supermarket is available for use by community organisations and charities. A stall on the Saturday before a public meeting could considerably raise the profile.
- **Town events** – such as Discovery Days, Lark in the Park, Food and Drinks Festivals

All of these methods of communicating with the community should include an email address, web address and phone number as well as a list of free publications that will be hand delivered on request. Publications should be available as PDFs online and in printed format and could include:

- **Factsheets:**
 - What are the issues? Climate Change, Peak Oil and energy prices
 - How much do we use? Energy consumption, carbon emissions and what everyone can do to reduce them
 - Generate our own – the options for green energy in Belper
 - Others? Around the issues of food production and transport
- **Feedback** – what happened at the public meetings, what is the community vision and how are we taking it forward
- **Diary of events** – what Transition Belper is doing, where and when
- **Getting involved** – how to join, support and volunteer. Specify what we need volunteers for e.g.:
 - Energy expert neighbour
 - Leaflet delivery round
 - Fruit and Veg expert neighbour
 - EPC/Green Deal Assessor training

5.3 Recording support

At every opportunity the names, addresses, telephone number and email addresses of those we come into positive contact with should be recorded along with information about whether they wish to:

- Join Transition Belper
- Be registered as a supporter and receive email updates
- Volunteer time
- Donate money

5.4 Web site

If all the above actions are to be successful the Transition Belper web site must be expanded to accommodate this new level of publicity and community engagement. It should also be made more interactive so that visitors can leave comments or suggestions or follow blog type discussions as well as register their interest and leave their contact details.

6. Action Plan

What	Who	When	Resources	Outcomes
<p>Redesign web site to be able to include all activities, publications, contacts, feedback, diary and discussions, comments and suggestions</p>			<p>Web designer - Aquaman design ?</p> <p>Web hosting</p> <p>Editing software or CMS</p>	<p>Web site fit for delivery of community engagement strategy</p>
<p>Organisation:</p> <ul style="list-style-type: none"> • Set up TB Energy Group • Develop Energy Descent Action Plan (EDAP) • Survey supporters 	<p>Ian Jackson</p> <p>TB Energy Group</p>	<p>October 2011</p> <p>November 2011</p> <p>November 2011</p>	<p>Survey Monkey</p>	<p>Guidance, targets and governance in place to manage projects going forward</p> <p>Greater awareness of supporter skills, interests and commitment</p>
<p>Group networking - Build relationships and organise joint workshops to develop common or complimentary strategies with:</p> <ul style="list-style-type: none"> • Belper Civic Forum • Belper Town Council • Amber Valley BC • DVMWHS • Other environmental, heritage and sustainability groups 	<p>TB Trustees (Core Group)</p>	<p>ongoing</p>		<p>Adoption by others of TB approach locally to the challenges of peak oil and climate change.</p> <p>Increased awareness of the challenge being faced and potential solutions</p> <p>Increased political and community support and engagement</p> <p>Definition of planning and building control constraints</p>
<p>Events – organise a presence (stall etc) at community events such as Discovery Days, Christmas Fare and Food and Drink festival.</p>				<p>Increasing awareness and supporter/activist recruitment</p>

<p>Public Meetings – organise a series of public meetings through winter/spring 2012:</p> <ul style="list-style-type: none"> • The need for action • How much energy we use • Generating our own energy 		<p>January 2012 March 2012 May 2012</p>	<p>Book venue Laptop, projector and screen Meeting planning Other resources as needed – pads, pens, flip charts, post-its etc Contact/interest forms Meeting relevant factsheets</p>	<p>Well attended meetings with community able to express views, make suggestions and feel included</p>
<p>All things Local – negotiate a regular article, add contact and web details and diary items.</p>		<p>By end of 2011</p>	<p>Meeting details Articles for inclusion Publication deadlines Maximum article length</p>	<p>Regular features from December/January issue onwards</p>
<p>Leaflet insert in Belper Express – write, design and print 15,000 leaflets for inclusion in Belper Express – themed to coincide with public meetings. Surplus leaflets to hand out locally</p>		<p>January 2012 March 2012 May 2012</p>	<p>Written articles Design Print (plus cost) Delivery to Derby Telegraph Insertion charge - £175 each</p>	<p>Test effectiveness by asking attendees how they found out about the meeting</p>
<p>Press Relations –establish contact with relevant journalist at Derby Telegraph, Amber Sound, Radio Derby and Belper News. Issue press releases, diary notifications and be available for interview</p>		<p>By end of 2011</p>		<p>Increased coverage of TB news items</p>
<p>Posters – design posters to convey the vision and advertise public meetings. Develop a network of poster sites including shop windows, notice boards etc</p>		<p>By end of 2011</p>	<p>Design, printing and distribution</p>	
<p>Hydro Interpretation Boards</p>				

Counter display boxes – source and obtain printed counter display boxes for use in shops, pubs, public buildings		By end of 2011	Design, printing and distribution	Increased TB visibility
Leaflets/factsheets for inclusion in display boxes		Changing content every 2 months from January 2012	Design, print and distribution	
Recording support – redesign contact form to obtain all contact details and whether member, supporter, volunteer or donator			Design and print	Increasing database of support. Ability to widely distribute updates and feedback
Morrison's stall – make contact with store and book entrance space for the Saturday before public meetings		January 2012 March 2012 May 2012	Display items, trestle table(s), support forms, leaflets	Increased TB visibility
Local distributors – recruit leaflet distributors. Design delivery rounds of 150 – 200 houses and allocate recruited distributors to a round local to them		Through Winter/Spring 2012	Large scale map of Belper area showing individual houses	75 distributors recruited by mid 2012
Energy Expert Neighbour – recruit volunteers willing to give energy advice to their neighbours (approx 115 each). Organise training session(s) to cover all basic aspects of energy advice		Through Winter/Spring 2012 and ongoing	Energy advice training	35 volunteers recruited by mid 2012 and ongoing
Green Deal Assessor – Recruit one volunteer to work part time or self employed as an assessor able to give professional advice. Referrals to be taken from Energy Expert Neighbours		By April 2012	Green Deal Assessor training and accreditation. Referrals to Green Deal Providers will attract referral fees split between assessor and TB (80/20)	Ability of assessor to meet his/her working aspirations through sufficient volume of referrals

Solar pv installers – develop approved list of local installers		By April 2012		
Insulation Schemes – seek cost framework for solid wall insulation, insulated loft storage platforms and other measures from Apex Carbon Solutions. Negotiate referral fees .		By November 2011		Ability to publicise offer through TB publications etc
Planning advice – seek clear guidance about what is/is not acceptable in DVMWHS, Buffer Zone, Conservation Area and listed buildings and what requires Planning Permission		For use at March Public meeting and accompanying publications and press releases		Approved text for use in leaflets/publications and at meetings. And available for use by Energy Expert Neighbours
Community Interest Company – set up CIC to further carbon emission reductions and reduce reliance on fossil fuels in the Belper area	Ian Jackson, Richard Keighley and David George	By November 2012	3 X £1 shares, bank account £35 registration fee Articles and Memorandum of Association	
Ambergate Hydro – discuss potential partnership working with site owners – LB Plastics – and obtain and update previous feasibility study	CIC	By February 2012		Memorandum of understanding to enable planning stages to be undertaken with a high level of confidence
Ambergate Hydro finance – obtain loan funding – preferably from LB Plastics – to commission consultants to take the project through to obtaining all required permissions. Contract to		March 2012 Tenders returned by July 2012 Permissions in place by January 2013		Up to £50,000 advance funding in return for free electricity until repaid (if LB Plastics)

include installation if/when required funding is in place. Commissioning by competitive tender				
CIC Bond offer – prepare a scheme prospectus to invite the community to fund the Ambergate Hydro project		By June 2012	Write, design and print	