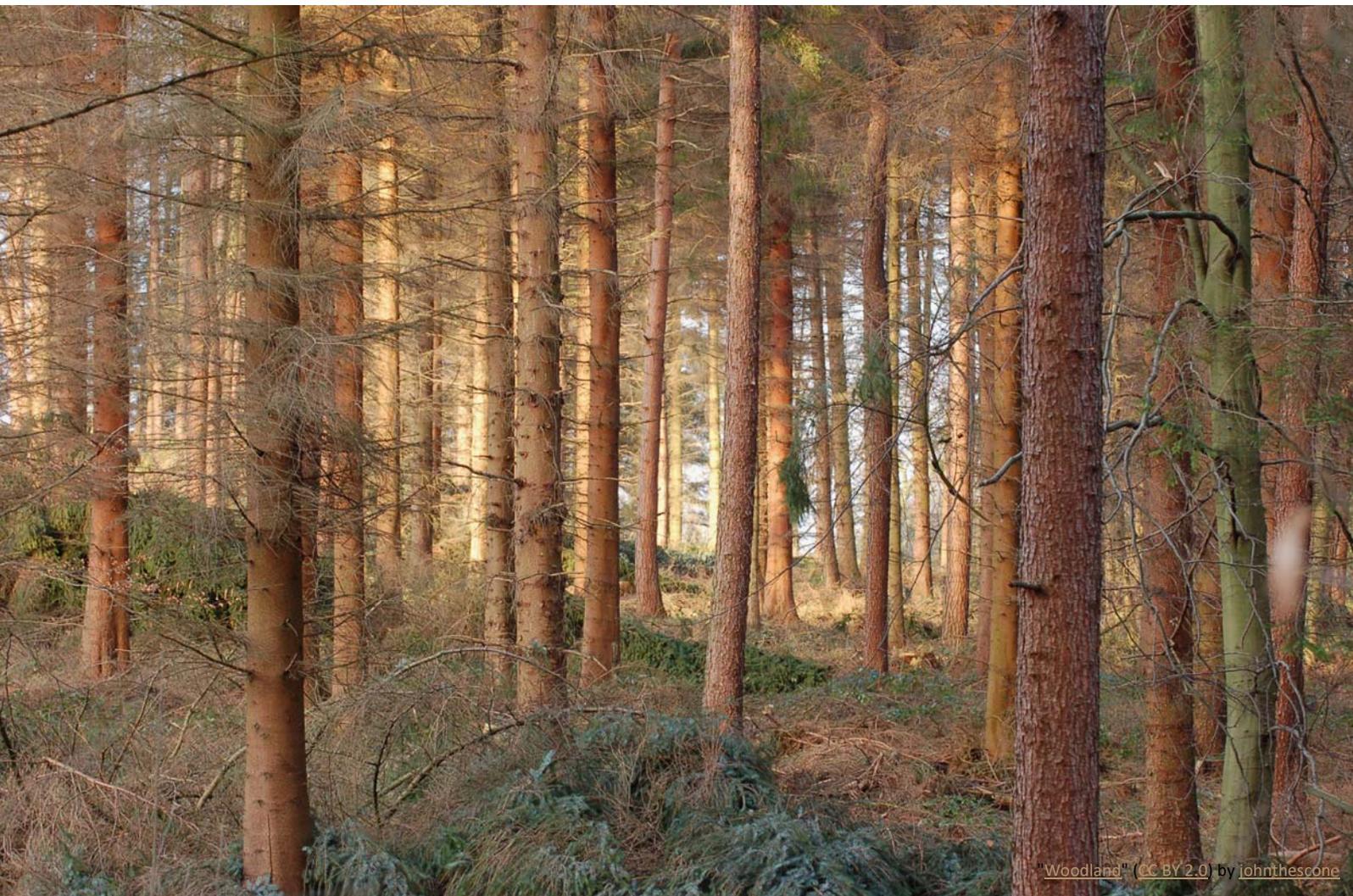


# Energy Efficiency in Penistone and Stocksbridge

How energy efficiency benefits residents and businesses in Penistone & Stocksbridge constituency



**Association for the  
Conservation of  
Energy**

# Key Points

Many people worry about their home energy bills, and for some people keeping their home warm is simply not affordable. For businesses, buildings with poor energy performance can be expensive to run, affecting their competitiveness. The only long term solution is to stop wasting fuel and leaking warmth from our homes and businesses by improving insulation, ensuring all buildings have modern, well controlled heating and cooling systems, and efficient lighting and appliances

## It can be expensive to heat and power local homes

- 36,000 of the 39,000 households in Penistone and Stocksbridge are connected to mains gas and typically pay around £1,300 a year for gas and electricity. The remaining 3,000 homes in the area have to use alternative fuels which are more expensive<sup>1</sup>.
- 6,800 homes in Penistone and Stocksbridge have been given the worst energy ratings of E, F or G<sup>2</sup>. These homes waste hundreds of pounds worth of fuel every year.

## Businesses have also felt the impact of high energy costs

- Many businesses in South Yorkshire operate out of old and poorly insulated buildings, with 33% having the very worst energy ratings of E, F or G<sup>3</sup>. Buildings with poor energy performance can be expensive to run. This affects business competitiveness, and makes it difficult to maintain a comfortable working environment for employees.

## Significant upgrades to the efficiency of buildings have been made in recent years

- National domestic energy efficiency schemes have helped to insulate 9,100 lofts and 6,200 cavity walls in the constituency since 2005<sup>4</sup>. At the same time more than 11,300 efficient boilers have been installed.
- Progress has also been made improving the efficiency of South Yorkshire's public buildings, 31% of those assessed achieved A or B ratings in 2015, up from just 17% in 2009.
- 1,400 solar photo-voltaic systems and 360 low carbon heating systems have been installed, enabling homes and businesses to generate their own electricity and low carbon heat<sup>5</sup>.

## These improvements generate a wide range of benefits for the area

- Penistone and Stocksbridge residents spend around £51 million on energy bills every year<sup>6</sup>. Across South Yorkshire businesses spend approximately £530 million annually on energy. Cutting fuel bills means less money leaving the local economy and more spent in local shops and businesses.
- Most of these energy efficiency improvements are delivered by local businesses and tradespeople. An ambitious UK energy efficiency programme would create 7,300 jobs in Yorkshire and the Humber<sup>7</sup> in the domestic retrofit market alone.
- Cold homes have been shown to be damaging to both physical and mental health. For every £1 invested in renovating cold homes the NHS saves 42 pence in reduced hospital admissions and GP visits, meaning more money for frontline services<sup>8</sup>.

## There are still huge opportunities to improve the efficiency of homes and businesses in Penistone and Stocksbridge further

- 21% (around 8,000 homes) could benefit from cavity wall insulation; 18% (around 7,000 homes) could improve the level of insulation in their lofts and 41% (around 16,000 homes) could upgrade to more efficient heating systems<sup>9</sup>.
- Over 60% of commercial and industrial buildings in South Yorkshire that have an energy rating are rated D or worse, meaning that the businesses occupying them could reduce their energy costs significantly

## Despite this potential, national policy commitments would see little progress made

- Current national policy commitment would see just 293 homes helped each year to 2020. Those in need of more significant works, common in rural areas, would miss out.
- Business can find it hard to access finance for energy efficiency investments, and there is no national action to change this

Upgrading the energy efficiency of Penistone and Stocksbridge's homes and businesses would present a huge opportunity to cut bills, improve residents' health and well-being and boost the local economy. To make this happen and unlock the benefits to the Constituency, action is needed both locally and nationally.

## The story so far

The cost of gas and electricity is 30% higher than it was in 2010 and double what it was 10 years ago<sup>11</sup>. To combat these historically high prices, a local army of unsung heroes have been fighting to keep bills in check and make sure everyone can afford to keep their homes warm and healthy and their businesses productive and profitable.

### Energy in homes

There are around 39,000 households in Penistone and Stocksbridge with 76% owning their homes, 9% renting privately and 15% living in social housing.

Over the last 10 years, Penistone and Stocksbridge has seen activity in improving insulation, replacing inefficient heating systems and developing renewable energy technologies. We estimate that since 2005 more than 26,500 significant works have been undertaken to improve the energy performance of homes in Penistone and Stocksbridge.

**Table 1: Estimated number of common efficiency improvements made to homes in Penistone and Stocksbridge since 2005<sup>4</sup>**

Lofts insulated	9,100
Cavity walls insulated	6,200
Efficient boilers installed	11,300

New insulation technologies such as cladding for solid walls have also greatly benefitted older homes which would otherwise still be leaking heat.

Penistone and Stocksbridge residents have also taken advantage of incentives that enable them to generate their own electricity and low-carbon heat.

**Table 2: Low Carbon technologies installed in homes in Penistone and Stocksbridge since 2010<sup>5</sup>**

Low carbon heating	360
Solar Photovoltaic sys-	1,420

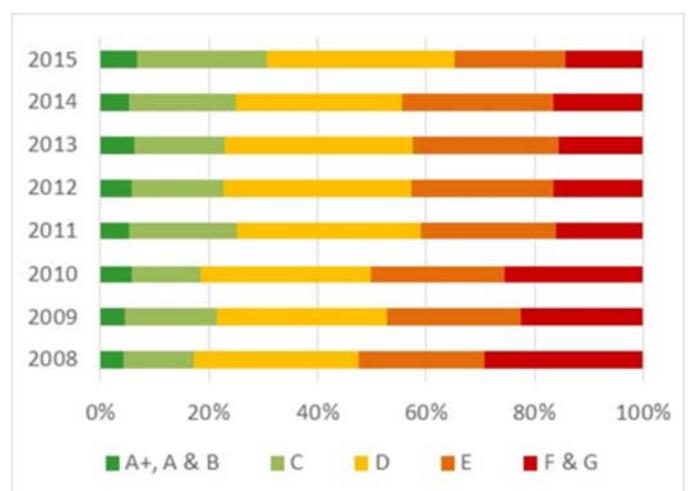
### Energy in businesses

The commercial and industrial stock in South Yorkshire comprises around 33,570 units with an average floor area of 445 m<sup>2</sup>. This includes 13,340 retail units, 6,500 office units and 10,780 industrial units. The remaining 2,970 are mostly school and university buildings, hospitals and healthcare, and a wide variety of buildings used for leisure like restaurants and cinemas<sup>12</sup>.

Large improvements have been made to non-domestic buildings. For example, there has been a big reduction in the number of F and G rated public sector buildings in South Yorkshire<sup>13</sup>.

All larger public buildings, such as schools and hospitals, are required to update their display energy certificates (DECs) every year. This allows the buildings' occupants to track their energy consumption over time and helps to highlight high energy consumption. Data from these certificates have shown a steady reduction in the number of poorly performing buildings in South Yorkshire. The year DECs were introduced (2008) 30% of buildings were rated as F or G. By 2015 the number of F and G-rated buildings had fallen to just 14%. Over the same period the number scoring A to C has gone from 17% up to 31%.

**Figure 1: DEC ratings of public buildings in South Yorkshire<sup>13</sup>**



By requiring organisations to keep track of and display their energy consumption, DECs are enabling the improvements in energy consumption to be clearly demonstrated. Unfortunately, however, at present DECs are not required for private non-domestic buildings, such as shops and offices, so it is not possible to see what—if any—improvements are occurring in those buildings.

Businesses in Penistone and Stocksbridge have also been investing in low carbon technologies.

**Table 3: Low Carbon technologies installed in businesses Penistone and Stocksbridge since 2010<sup>5</sup>**

Low carbon heating	44
Solar Photovoltaic systems	21

National policies have played an important role at the local level. Charities in Penistone and Stocksbridge have been able to access funds to provide low income households with the heating upgrades they desperately need, and incentive schemes have encouraged people to try new technologies like solar panels. The dedication of local businesses and charities, combined with national funding and incentive schemes, have been pivotal in the progress made so far in Penistone and Stocksbridge.

## The Old Corn Mill: An award winning green building in Millhouse Green near Penistone achieves substantial savings in energy, carbon and bills!



The Old Corn Mill, in Millhouse Green near Penistone, is one of very few commercial buildings in the country to achieve an Energy Performance Certificate A+ rating. It also won a prestigious Green Apple award for Built Environment and Architectural Heritage and was the first in the country to successfully apply for the Government's Renewable Heat Incentive.



The original 18th century Old Corn Mill has been renovated with triple glazing, substantial wall, floor and ceiling insulation, low-energy appliances and lighting, an insulated lobby and underfloor heating provided by a geothermal water source heat pump. The site also has solar panels, wind turbines and a hydro scheme on the River Don that generates renewable electricity, as well as a biomass boiler and an additional geothermal heat pump. Furthermore, they are in the process of commissioning a renewable energy storage system which will help them go further in achieving their aims of total carbon neutrality.

Charles Booth, the site owner comments –*“The project started back in 2008. We were analysing the fixed costs of our business and were horrified at our gas and electricity costs. We decided to change the way that we ran our business. Firstly, we installed the highest level of insulation, then we invested in low energy equipment and finally we invested in renewables and energy storage. The success of the project has been incredible; our electricity consumption has reduced by 80% and our heating demand by 60%. Our on-site renewable heat and electricity systems now produce more energy than we use over the course of the year”.*

*“There is a lot of green technology available nowadays but we found that the easiest and most effective way of saving energy is through installing the highest level of insulation available. I think if more businesses knew about how much they could save, more people would do this. However, I also think that legislation is key - it is the only reason many people change their habits and it is really important that they do so!”*

# Untapped potential

Whilst a promising start has been made to modernise heating systems and insulation in Penistone and Stocksbridge, there are huge opportunities still remaining and many households and businesses that have yet to benefit.

## Potential for homes

Detailed surveys of 1,245 homes representing the housing stock of Yorkshire and the Humber were conducted as part of a nationwide housing survey. Surveyors identified a range of opportunities to improve energy efficiency in the homes they visited.

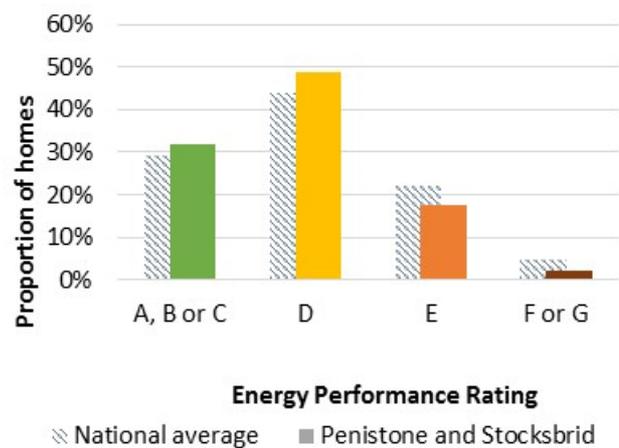
**Table 4: Estimated number of homes in Penistone and Stocksbridge that could benefit from basic energy efficiency measures based on survey sample<sup>9</sup>**

	On mains gas	Off mains gas
<b>Could improve the level of insulation in their lofts</b>	6,800	300
<b>Could benefit from cavity wall insulation</b>	7,400	600
<b>Could benefit from solid wall insulation</b>	7,100	700
<b>Could improve the efficiency of their heating systems</b>	14,200	1,700

Despite the significant potential, local charities and installers have found that changes to national energy efficiency schemes in the last few years have meant that funding for low income households is harder to get hold of and support for making costlier upgrades is no longer available.

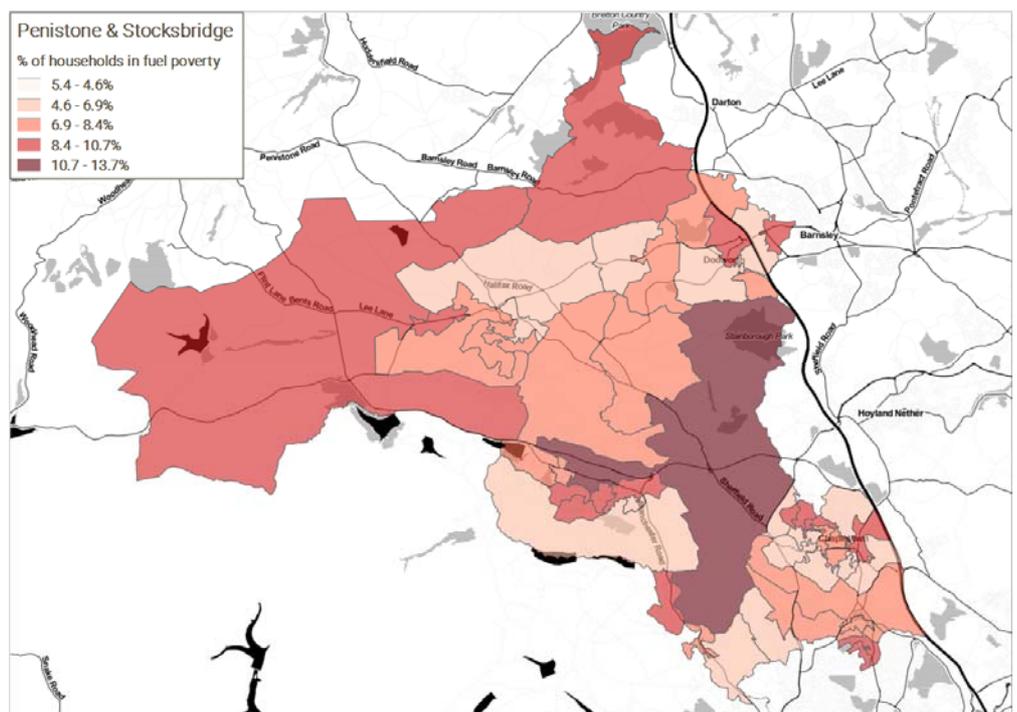
Looking to the future, current national policy commitments would see just 293 homes receive low cost improvements in Penistone and Stocksbridge each year and those in need of more significant works, common in rural areas, would miss out altogether<sup>10</sup>.

**Figure 2: Energy Performance Rating of homes in Penistone and Stocksbridge compared to National Average<sup>2</sup>**



There are 23,700 homes in Penistone and Stocksbridge with an Energy Performance Rating of D or worse that could benefit from improved efficiency. The proportion of homes with the very lowest ratings of E, F and G is slightly lower than the national average due to the types of dwellings present in the area and the progress made to date. However, these homes still number 6,800 and are likely to be in urgent need of attention<sup>2</sup>.

Upgrading the energy efficiency of these homes would present a huge opportunity to cut bills, improve residents' health and well-being and boost the local economy. To make this happen, action is needed both locally and nationally.



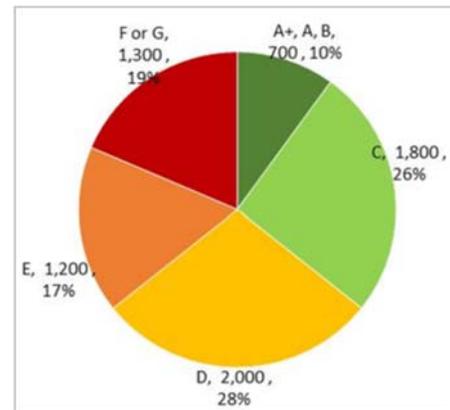
**Figure 3: Map showing severity of 'fuel poverty' in Penistone and Stocksbridge. Homes in darkly shaded areas are more likely to find keeping their homes warm unaffordable. High resolution housing data can be used to identify opportunities and target those in need<sup>14</sup>**

## Potential for businesses

All commercial and industrial buildings are required to have an Energy Performance Certificate (EPC) if they are sold or let to a new tenant. Since 2008, 13,900 EPCs have been lodged in South Yorkshire for non-domestic buildings. Of these certificates, two thirds (8,800 buildings) received an efficiency rating of D or worse<sup>3</sup>. These buildings would benefit from improvements to their fabric and energy services of these 2,300 buildings are rated F or G, meaning that they are very inefficient and likely to be wasting a large amount of energy.

Public buildings like schools and hospitals use a significant amount of energy. Even though progress has been made, there is still huge room for improvement. Half of buildings rated were given a score of D or worse; these buildings are likely to have significant potential for improvements. Ensuring action in this area is particularly important as public buildings are well placed to demonstrate best practice in low energy buildings and provide a leadership role for building energy management.

Figure 3: EPC ratings of non-domestic buildings in South Yorkshire<sup>3</sup>



The non-domestic building stock is extremely diverse so a wide range of solutions are needed to address their energy consumption. Innovative approaches, such as those highlighted in our case study, The Old Corn Mill, for example, may be required as well as more traditional fabric refurbishment.

## Better Homes Barnsley: making homes more energy efficient in Yorkshire

Better Homes Barnsley is part of the wider Better Homes Yorkshire scheme that was set up 18 months ago to deliver energy efficiency measures to private sector housing. The scheme was designed to maximise the ECO and Green Deal funding available at the time. At its core were the aims of: encouraging wider investment in the energy efficiency market in the region, creating full time jobs, reducing fuel poverty and enabling people to live in warmer, healthier homes.

**Better Homes  
Barnsley**

Under the Better Homes Barnsley scheme the Penistone and Stocksbridge area has received 33 enquiries for energy efficiency installations and to date a total of 9 have been carried out these measures include: boiler replacements, central heating installations and room in roof and loft insulation. One of the residents who has benefited from this scheme is Mr John Key, he has had a new energy efficient heating system installed in his property. The positive impact that this has had on Mr Key is clear, he states "I've never had central heating as I thought that I couldn't afford to have it fitted or run it because I'm a pensioner. It was very cold upstairs in winter, especially at night time...Having central heating fitted has made a real difference, I'm very happy now I'm warm in my house.."

There is a huge potential in the local area to increase the number of energy efficiency measures being installed and there is clear appetite among local people. However, there are substantial barriers. Firstly, due to recent funding cuts, the initial target of 1,200 measures in the first 3 years is unlikely to be achieved, with a figure of 400 now being more likely. The focus has had to turn to alternative sources of funding to try and boost the numbers that can be installed. Secondly, there has been difficulty obtaining and sharing accurate data to help with targeting of eligible households and this has meant that the local authority has had to become more involved in identifying these households which has been both costly and time consuming.

While there have been many success stories for Better Homes Barnsley, in order to help them and schemes like theirs achieve their full potential there is a need for clear long term energy efficiency policy from central government. As Councillor Roy Miller, of Barnsley Metropolitan Borough Council says:

"Long term policy is needed to allow for consistency of support for vulnerable households and to allow relationships to develop with other services who are involved with these groups. In particular the housing and health agenda needs to be more closely aligned, given the potential savings that could be made for the NHS by investing in improving existing housing stock."

# Real benefits for Penistone and Stocksbridge

It is easy to see the benefits of reducing your energy bills and having a warmer home and place of work, but the impact of upgrading the buildings in Penistone and Stocksbridge goes much further.

## Well maintained homes

- Energy efficiency works are a vital part of maintaining your home. Cold homes often become damp which can lead to mould and further complications in the long run. Insulated wall cladding will tackle damp permanently and can rejuvenate the appearance of a home.

## Keeping money in the local economy

- We estimate that Penistone and Stocksbridge residents spend approximately £51 million annually on domestic energy bills<sup>6</sup>. Across South Yorkshire businesses spend approximately £530 million annually on energy. Money spent on fuel is mostly taken out of the local economy, so cutting bills means that households have more money to spend in local shops and businesses.

## Creating skilled Jobs

- Economists have estimated that an ambitious UK energy efficiency programme would create 7,300 jobs in Yorkshire and the Humber<sup>7</sup> in the domestic retrofit market alone. Energy efficiency works rely on skilled tradespeople and small-scale contractors. This means that these jobs are spread across all communities and not just concentrated in a few industrial areas.

## Improving health and wellbeing

- Cold homes have been shown to be damaging to both physical and mental health. Children living in cold homes are significantly more likely to suffer from respiratory problems such as asthma and bronchitis. It has been shown that for every £1 invested in renovating cold homes, the NHS saves 42 pence in reduced hospital admissions and GP visits<sup>8</sup>.

## Business productivity

- Energy costs can be a significant overhead for businesses. Improving the efficiency of commercial buildings, vehicles and equipment can cut waste and add to the bottom line. In the retail sector, cutting energy costs by 20% can have the same impact on the bottom line as a 5% increase in sales<sup>15</sup>. Helping local businesses to identify these opportunities can make them more competitive.
- Increased efficiency can also make it easier and cheaper to maintain a workplace at a comfortable temperature, and there is good evidence to show that this leads to increased worker productivity and hence financial benefits to employers<sup>16</sup>. Crucially, thermal comfort in the work environment is now well-established as a real boon to workers' health and wellbeing as well as productivity<sup>17</sup>.

## Improving local energy resilience

- It is easy to take basic services like gas and electricity for granted, but our energy security has become a significant concern in recent years. A more efficient building stock and local generation will make Penistone and Stocksbridge more resilient to future energy price shocks or interruptions to supply and can take the strain off local energy infrastructure.

## With thanks to

- Charles Booth, owner of The Old Corn Mill and Director of Booth Brothers <http://www.umbrellacollection.co.uk/>
- Richard Kershaw, Group Leader - Spatial Planning & Sustainability and Claire Miskell, Project Manager - Housing and Energy at Barnsley Metropolitan Borough Council. For more information about the Better Homes Barnsley scheme, see <http://www.betterhomesyorkshire.co.uk/barnsley>

And

- Calor, for sponsoring the development of this report



## More to explore

- Nearest Super Home – Sheffield, Eastgrove Road: a Victorian semi-detached house that achieved 60% reduction in carbon emissions <http://www.superhomes.org.uk/superhomes/eastgrove-road-sheffield/>
- Nearest certified Passive House – Denby Dale: The Denby Dale Passivhaus has pioneered the combination of low energy Passivhaus methodology with standard British cavity wall construction and building materials and is the UK's first cavity wall Passivhaus. <http://passivhausbuildings.org.uk/viewproject.php?id=232>

## Notes

- <sup>1</sup> Based on an average electricity bill in Penistone and Stocksbridge of £555 and on-gas properties spending an additional £700 per year on gas. The estimates are based on 2015 DECC lower super output area (LSOA) [domestic gas](#) and [electricity consumption data](#) and fuel tariffs from 2015 DECC [regional fuel price data](#). Off-gas residents assumed to spend an additional £1,704 on oil annually, the national average expenditure for oil-heated properties from the DECC [Living Cost & Food Survey](#)
- <sup>2</sup> 2015 DECC LSOA-level [household energy efficiency ratings data](#)
- <sup>3</sup> CLG (2016) [Live tables on Energy Performance of Buildings Certificates](#): 'Table A: non-domestic Energy Performance Certificates by energy performance asset rating'
- <sup>4</sup> Delivery of measures 2005-2012 derived from a sample of [4,857 homes in Yorkshire and the Humber](#), adjusted to reflect the number of off-gas properties in the Penistone and Stocksbridge Constituency. Delivery of measures after 2012 based constituency level 2015 DECC [GD & Energy Company Obligation \(ECO\)](#)
- <sup>5</sup> 2015 DECC [Feed-in Tariff \(FiT\)](#) and [Renewable Heat Incentive \(RHI\)](#) statistics
- <sup>6</sup> Derived estimate based on average bill data (described in end note 1) with household number data from 2015 DECC [meter data](#) and [regional statistics](#)
- <sup>7</sup> Verco & Cambridge Econometrics, 2012, [Jobs, growth and warmer homes](#)
- <sup>8</sup> Department of Health, 2009, [On the state of public health: Annual report of the Chief Medical Officer 2009](#)
- <sup>9</sup> Estimate is based on surveys of 1,245 homes in Yorkshire and the Humber, adjusted to reflect the number of off-gas properties in the Penistone and Stocksbridge Constituency. Survey data part of the 2015 DCLG [English Housing Survey](#).
- <sup>10</sup> Based on Penistone and Stocksbridge Constituency receiving a fair share of the [Autumn Statement pledge](#) to deliver low cost energy efficiency measures to 200,000 homes each year during this Parliament
- <sup>11</sup> 2015 DECC [domestic energy price statistics](#)
- <sup>12</sup> Non-domestic floor space estimate based on Valuation Office Agency (VOA) (2012) [Business Floorspace \(Experimental Statistics\)](#)
- <sup>13</sup> CLG (2016) [Live tables on Energy Performance of Buildings Certificates](#): 'Table DEC1: Display Energy Certificates by local authority and energy performance operational rating'
- <sup>14</sup> 2015 DECC constituency and LSOA level [fuel poverty data](#)
- <sup>15</sup> Carbon Trust's [Energy efficiency advice for retail businesses](#)
- <sup>16</sup> LBNL Indoor Environment Group. 2016. "[Cost Effectiveness of Improving Indoor Environments to Increase Productivity / Indoor Air Quality \(IAQ\) Scientific Findings Resource Bank \(IAQ-SFRB\)](#)." Lawrence Berkeley National Laboratory
- <sup>17</sup> World Green Building Council, 2016, [Health, Wellbeing and Productivity in Office: The Next Chapter for Green Offices](#)