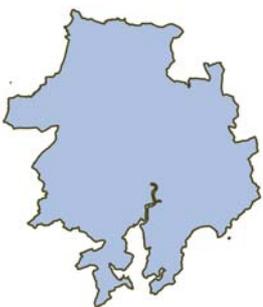


Energy Efficiency in Truro & Falmouth

How energy efficiency benefits residents and businesses in Truro & Falmouth constituency



"Trelissick" (CC BY-ND 2.0) by Robert Pittman



**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 and 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, particularly for those living in rural areas without a gas connection

- 24,000 of the 41,000 households in Truro and Falmouth are connected to mains gas and typically pay around £1,300 a year for gas and electricity. The remaining 17,000 homes in the area have to use alternative fuels which are more expensive¹.
- 5,800 homes in Truro and Falmouth have been given the very worst energy ratings of F or G, which is three times the national average². These homes waste hundreds of pounds worth of fuel every year.

Businesses have also felt the impact of high energy costs in Cornwall

- Many Cornish businesses operate out of old and poorly insulated buildings, with 36% having the very worst energy ratings of E, F or G³. 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 7,400 lofts and 5,500 cavity walls in the constituency since 2005⁴. At the same time more than 7,800 efficient boilers have been installed.
- Progress has been made improving the efficiency of Cornwall's public buildings, 18% of those assessed achieved A or B ratings in 2015, up from just 4% in 2009.
- 3,058 solar photo-voltaic systems and 1,701 low carbon heating systems have been installed, enabling homes and businesses to generate their own electricity and low carbon heat⁵.

These improvements generate a wide range of benefits for the area

- Truro and Falmouth residents spend around £77 million on energy bills every year⁶. Across Cornwall businesses spend approximately £195 million annually on energy. Cutting fuel bills means less money leaving the local economy and more spent in local shops and businesses.
- Many energy efficiency improvements are delivered by local businesses and tradespeople. An ambitious UK energy efficiency programme would create 8,400 jobs in the South West⁷ 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 services⁸.

There are still huge opportunities to improve the efficiency of homes and businesses in Truro and Falmouth further

- 26% (around 11,000 homes) could benefit from cavity wall insulation, 23% (around 10,000 homes) could improve the level of insulation in their lofts and 59% (around 24,000 homes) could upgrade to more efficient heating systems⁹.
- Over 60% of commercial and industrial buildings in Cornwall 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 310 homes helped each year to 2020¹⁰. 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 currently no national action to change this.

Upgrading the energy efficiency of Truro and Falmouth'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 ago¹¹. 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 41,000 households in the constituency with 67% owning their homes, 20% renting privately and 13% living in social housing. More than 40% of homes are not connected to mains gas making their energy costs even higher.

Over the last 10 years in Truro and Falmouth the insulation of homes has been improved, inefficient heating systems have been improved or replaced and renewable energy technologies installed. We estimate that since 2005 more than 21,000 significant works have been undertaken to improve the energy performance of homes in Truro and Falmouth.

Table 1: Estimated number of common efficiency improvements made to homes in Truro and Falmouth since 2005⁴

Lofts insulated	7,400
Cavity walls insulated	5,500
Efficient boilers installed	7,800

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

Truro and Falmouth residents have 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 Truro and Falmouth since 2010⁵

Low carbon heating	1,392
Solar Photovoltaic systems	2,007

Energy in businesses

The commercial and industrial stock in Cornwall comprises around 17,920 units with an average floor area of 225 m². This includes 6,620 retail units, 2,300 office units and 6,220 industrial units. The remaining 2,780 are mostly school and university buildings, hospitals and healthcare, and a wide variety of buildings used for leisure like restaurants and cinemas¹².

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 Cornwall¹³.

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 Cornwall. The year after DECs were introduced (2009) 33% scored E, F or G. By 2015 the number of F and G-rated buildings was down to just 7%. Over the same period the number scoring A to C has gone from 28% up to 50%.

Figure 1: DEC ratings of public buildings in Cornwall¹³



By requiring organisations to keep track of and display their energy consumption, DEC's are enabling the improvements in energy consumption to be clearly demonstrated. Unfortunately, however, at present DEC's 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 Truro and Falmouth have also been investing in low carbon technologies.

National policies have played an important role at the local level. Charities in Truro and Falmouth 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 Truro and Falmouth.

Table 3: Low Carbon technologies installed in businesses Truro and Falmouth since 2010⁵

Low carbon heating	309
Solar Photovoltaic systems	68

Blue Flame: an award winning heating company committed to investing in Cornwall and its people

Blue Flame is a heating solutions company based in Penryn in Cornwall. It was started 28 years ago and now employs 110 people, 23 of whom are currently within their apprenticeship programme. The company has experience installing all types of heating systems including renewable heating systems.



The company has a strong community ethic, not only through its award-winning apprenticeship scheme (which 60% of their staff came through) but also through offering work experience placements and its “adult learners back to work scheme”. They also have a partnership with Cornwall College. Together they have developed the “Blue Flame Academy”, which provides early learning stages of the apprenticeship programme and gives prospective candidates an introduction to the plumbing and heating industry.

Whilst much of their work comes through private customers, they have also worked with Cornwall Council and housing associations on larger schemes. One such scheme was where Cornwall Council was funded by the Department of Energy and Climate Change’s ‘Central Heating Fund’. Coastline housing association was selected for the installation of 118 gas central heating systems in previously off-grid homes. In addition a further 12 properties were connected to an innovative community ground source heat pump system, using Kensa heat pumps (another Cornish company based in the Truro and Falmouth constituency). All installations were undertaken by Blue Flame’s team. The community heat pump system was a first of its kind in Cornwall and had a great reception from residents “Our old night storage heaters were a waste of space, they didn’t stay warm. The heat pump heats up the house quickly and is easy to control using the thermostat. They [Blue Flame] did a great job!”

Paul Smith (Director) says of this work: “Blue Flame are proud to be the company that have installed these new heating systems in the homes of so many people in our community. They are now benefiting from warmer healthier homes. To know they will be comfortable and save some money at the same time gives us all a great sense of achievement. What’s more, this single project directly provided employment for 6 adult learners and 2 apprentices who will become the future engineers of the heating industry.”

Untapped potential

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

Potential for homes

Detailed surveys of 1,271 homes representing the South West's housing stock 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 Truro and Falmouth that could benefit from basic energy efficiency measures based on survey sample⁹

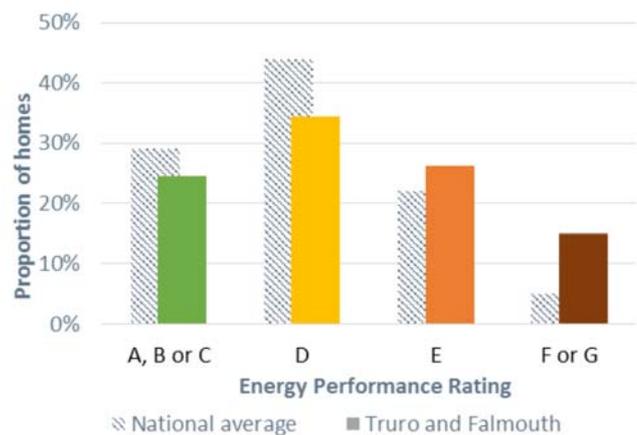
	On mains gas	Off mains gas
Could improve the level of insulation in their lofts	4,900	4,700
Could benefit from cavity wall insulation	6,200	4,400
Could benefit from solid wall insulation	5,800	4,500
Could improve the efficiency of their heating systems	10,500	13,900

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 310 homes receive low cost improvements in Truro and Falmouth each year and those in need of more significant works, common in rural areas, would miss out altogether¹⁰.

Figure 2: Energy Performance Rating of homes in Truro and Falmouth compared to National Average



There are 29,000 homes in Truro and Falmouth with an Energy Performance Rating of D or worse that could benefit from improved efficiency. 6,000 of these have the very worst ratings of F or G and are likely to be in urgent need of attention².

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.

Cornwall Council: working for a better deal for Cornwall

Anthony Ball is the 'Public Health's Tackling Inequalities and Winter Wellness Lead' at Cornwall Council and the Council of the Isles of Scilly. He currently oversees the Winter Wellness fuel poverty programme of some 30 partners that has helped over 6,000 households to stay warm, improve their health and progress to work, as well as the £2.3m Central Heating Fund to install first time central heating in over 375 homes. In 2015 Cornwall Council's was awarded 'Most Proactive Public Sector Body' at the South West Green Energy Awards, the award recognised a number of achievements including the delivery of "3,000 home energy retrofits, saving more than 500 hospital admissions annually".

However, he is acutely aware that Cornwall is above the national average for homes in fuel poverty. "One of the reasons for this has been the challenges Cornwall faces in delivering national energy efficiency schemes [the Energy Company Obligation (ECO) and its predecessors] which have been largely due to the nature of the region's housing stock and its rural context". Recognising these challenges and the benefits associated with using local knowledge to more effectively reach fuel poor and vulnerable households, Public Health, Economic Development and Inclusion Cornwall have worked via Cornwall's Devolution Deal in order to achieve greater autonomy for Cornwall. Through the piloting of policy changes that will empower the council to deem householders eligible for energy efficiency grants through BEIS's proposed Local Authority Declaration mechanism, Cornwall Council aims to enable more vulnerable households to benefit from funded energy efficiency improvements to their home. They aim to do this through increasing the uptake of the Affordable Warmth element of the ECO programme in line with Government's greater prioritisation of fuel poverty. Our ambition is that "The new flexible eligibility criteria is a positive step towards accelerating moving more of Cornwall's residents out of fuel poverty"

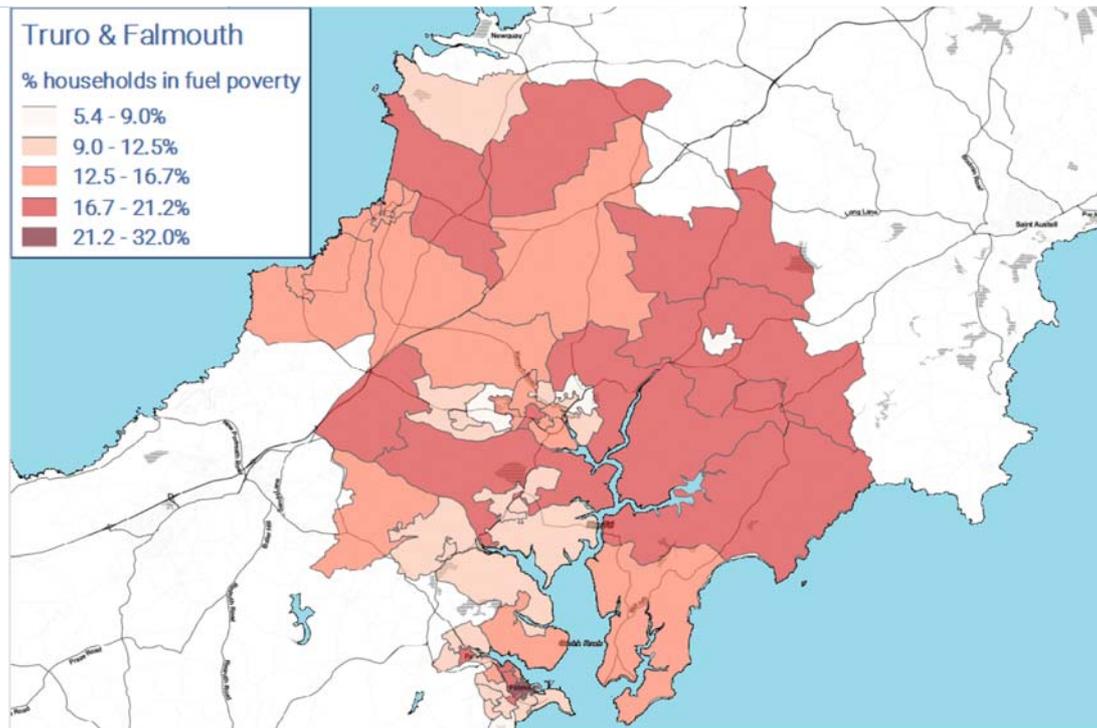


Figure 3: Map showing severity of 'fuel poverty' in Truro & Falmouth. Homes in darkly shaded areas are more likely to find keeping their homes warm unaffordable. High resolution housing data can be used to identify opportunities and target those in need¹⁴

Community Energy Plus – combining practical help for households with innovative research

Community Energy Plus is a Truro-based charity and social enterprise. It provides households in Cornwall with energy advice, collective fuel purchasing and tariff switching, and support for community energy projects. They recently secured funding from the British Gas Energy Trust's Healthy Homes Fund to deliver their 'Smart Warmth' programme to help vulnerable and low income Cornish householders keep warm and well in their homes.



COMMUNITY ENERGY PLUS

Grants of up to £300 are being made available through the programme to low income households with long-term health conditions to make energy efficient home improvements to help them maintain healthy room temperatures. This scheme is innovative as it caters for a wide variety of people, including those on low incomes but not in receipt of benefits to fund measures which cannot be funded by other sources. It includes a wide range of measures to provide and retain heat as well as reducing condensation and mould which are common in Cornish homes due to the county's humid climate. It is anticipated that the grants will help over 300 households to enjoy warmer, healthier homes.

The Smart Warmth project is seeing the development and trial of innovative state of the art thermometer badges that will alert the wearer when the room is too cold or hot. The badges are being made available to 50 householders who are aged 65 or older and have respiratory or cardiovascular illnesses to help them to keep comfortable and healthy in their homes and use a personalised action plan if their badge alerts them to an unhealthy room temperature. Along with the temperature data, interviews will be undertaken with the volunteers and their carers to assess more clearly than before the actual effect of energy efficiency measures on comfort, wellbeing and health. The grant funding is also enabling Community Energy Plus to deliver freephone energy advice and home visits for those who need more in-depth advice and would benefit from one-to-one support in their homes.

Chief Executive Dr Tim Jones said: "It is great to get this funding to undertake these projects, as Cornwall has some of the highest rates of fuel poverty in the country, which means that this work is urgently needed."

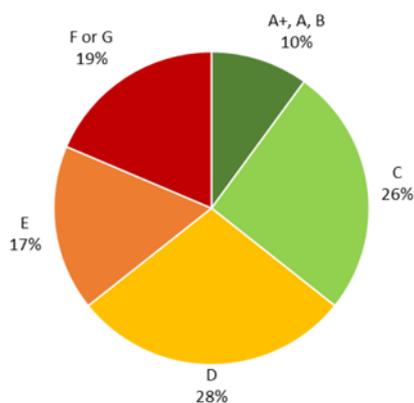
However, Tim is adamant that much more needs to be done: "What we really need is a stable and long-term investment plan to eradicate fuel poverty. Due to Cornwall's housing stock and geographical location, Cornwall has missed out on funding in the past as national schemes have focussed on improving the energy efficiency of 'easy to treat' homes. What's more, just as it seemed that programmes were finally in place to help those in traditional solid walled homes, we saw a perfect storm of disastrous circumstances which effectively put the sector back by 20 years. The failure of the Green Deal, significant cuts to both the Energy Company Obligation and the Feed-in Tariff mean that Cornwall's once booming green sector, with multiple insulation and renewable energy installers, has stalled.

There are people in Cornwall with the right skills and expertise – we just need support from central and local government to get on with the job of creating the right environment once again where the green sector can once again thrive."

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, 7,000 EPCs have been lodged in Cornwall for non-domestic buildings³. Of these certificates, two thirds (4,480 buildings) received an efficiency rating of D or worse³. These buildings would benefit from improvements to their fabric and energy services. 1,330 of these buildings are rated F or G, meaning that they are very inefficient and likely to be wasting a large amount of energy.

Figure 3: EPC ratings of non-domestic buildings in Cornwall³



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.

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, Wattstor, for example, may be required as well as more traditional fabric refurbishment.

Wattstor—innovation in Cornwall: building local energy resilience

Wattstor, founded in January 2013, are pioneers in the UK energy storage market. They produce and install electricity storage systems for domestic, commercial and industrial properties. They have also developed an energy management system that allows appliances to be turned on or off (or up and down) to match the generation of electricity at that time, with any surplus generated electricity being stored for later use. The goal of their systems is to maximise the consumption of renewable electricity generated on-site whilst minimising the import of grid electricity. Their market leading systems were voted Winner of Best New Product at the 2013 Cornwall Sustainability Awards. Initially based in Cornwall, they now work all over the UK.



Carley's organic food eco-factory



The bespoke Wattstor energy management and storage system

An example of a successful installation is in Carley's organic food factory in Chasewater, Cornwall. The organisation moved into their new 'eco' factory in 2014 which has a 30kW Solar PV array, a highly insulated building fabric and a biomass heating system. Their aim was to reduce their carbon footprint as far as possible and move towards being completely self-sufficient. After the installation of a bespoke Wattstor storage and priority switching system, they are able to power their appliances throughout the night from their own solar electricity and have also seen significant reductions in their bills.

Whilst Wattstor has seen great success over the past few years, they are critical of the UK's energy policy. Mark Smith, Managing Director of Wattstor said "our business plans have to continuously change and adapt to the changing policy framework and associated market." Mark says what is needed is "stable energy policy and clear favourable conditions for energy storage e.g. smart metering, classification of storage as an energy saving material for VAT and enhanced capital allowances."

Real benefits for Truro and Falmouth

It is easy to see the immediate benefits of reducing your energy bills and having a warmer home and place of work, but the impact of upgrading the buildings in Truro and Falmouth 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 Truro and Falmouth residents spend approximately £77 million annually on domestic energy bills⁶. Across Cornwall businesses spend approximately £195 million annually on energy. Money spent on fuel is mostly taken out of the local economy, so cutting bills means that local people 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 8,400 jobs in the South West⁷ 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 visits⁸.

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. 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 employers¹⁵. Helping local businesses to identify these opportunities can make them more competitive.
- In the retail sector, cutting energy costs by 20% can have the same impact on the bottom line as a 5% increase in sales¹⁶. Crucially, thermal comfort, good indoor ventilation and lighting quality in the work environment, is now well-established as a real, quantified boon to workers' health, wellbeing and productivity¹⁷.

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 Truro and Falmouth more resilient to future energy price shocks or interruptions to supply and can take the strain off local energy infrastructure.

With thanks to

- Paul Smith, Director of Blue Flame Cornwall, www.blueflameheat.co.uk
- Mark Smith, Founder of Wattstor, wattstor.com
- Dr Tim Jones, Chief Executive of Community Energy Plus, cep.org.uk
- Anthony Ball, Tackling Inequalities and Winter Wellness lead at Cornwall Council and the Council of the Isles of Scilly. Details of the winter wellbeing scheme www.cornwall.gov.uk/winterwellbeing

And

- Calor, for sponsoring the development of this report



More to explore

- FEP (Falmouth Energy Partnership: Action for local energy wealth), a social enterprise with an aim to develop and implement an integrated sustainable energy action plan for the Falmouth and Penryn Community Network area www.falenergy.co.uk



- TREE (Truro eco energy), a community group with a vision of reducing the carbon footprint of Truro and surrounding parishes, reducing fuel poverty and increasing community cohesion truroecoenergy.wordpress.com



- Nearest Super Home - Wadebridge, Burlawn, Myrtle Cottage www.superhomes.org.uk
- Nearest certified Passive House - Ford Close, St Ive passivhausbuildings.org.uk

Notes

¹ Based on an average electricity bill in Truro and Falmouth of £771 and on-gas properties spending an additional £551 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](#)

² 2015 DECC LSOA-level [household energy efficiency ratings data](#)

³ CLG (2016) [Live tables on Energy Performance of Buildings Certificates](#): ‘Table A: non-domestic Energy Performance Certificates by energy performance asset rating’

⁴ Delivery of measures 2005-2012 derived from a sample of [4,809 homes in the South West](#), adjusted to reflect the number of off-gas properties in the Truro and Falmouth Constituency. Delivery of measures after 2012 based constituency level 2015 DECC [GD & Energy Company Obligation \(ECO\)](#)

⁵ 2015 DECC [Feed-in Tariff \(FiT\)](#) and [Renewable Heat Incentive \(RHI\)](#) statistics

⁶ Derived estimate based on average bill data (described in end note 1) with household number data from 2015 DECC [meter data](#) and [regional statistics](#)

⁷ Verco & Cambridge Econometrics, 2012, [Jobs, growth and warmer homes](#)

⁸ Department of Health, 2009, [On the state of public health: Annual report of the Chief Medical Officer 2009](#)

⁹ Estimate is based on surveys of 1,271 South West homes, adjusted to reflect the number of off-gas properties in the Truro and Falmouth Constituency. Survey data part of the 2015 DCLG [English Housing Survey](#).

¹⁰ Based on Truro and Falmouth 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

¹¹ 2015 DECC [domestic energy price statistics](#)

¹² Non-domestic floor space estimate based on Valuation Office Agency (VOA) (2012) [Business Floorspace \(Experimental Statistics\)](#)

¹³ CLG (2016) [Live tables on Energy Performance of Buildings Certificates](#): ‘Table DEC1: Display Energy Certificates by local authority and energy performance operational rating’

¹⁴ 2015 DECC constituency and LSOA level [fuel poverty data](#)

¹⁵ 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

¹⁶ Carbon Trust’s [Energy efficiency advice for retail businesses](#)

¹⁷ World Green Building Council, 2016, [Health, Wellbeing and Productivity in Office: The Next Chapter for Green Offices](#)