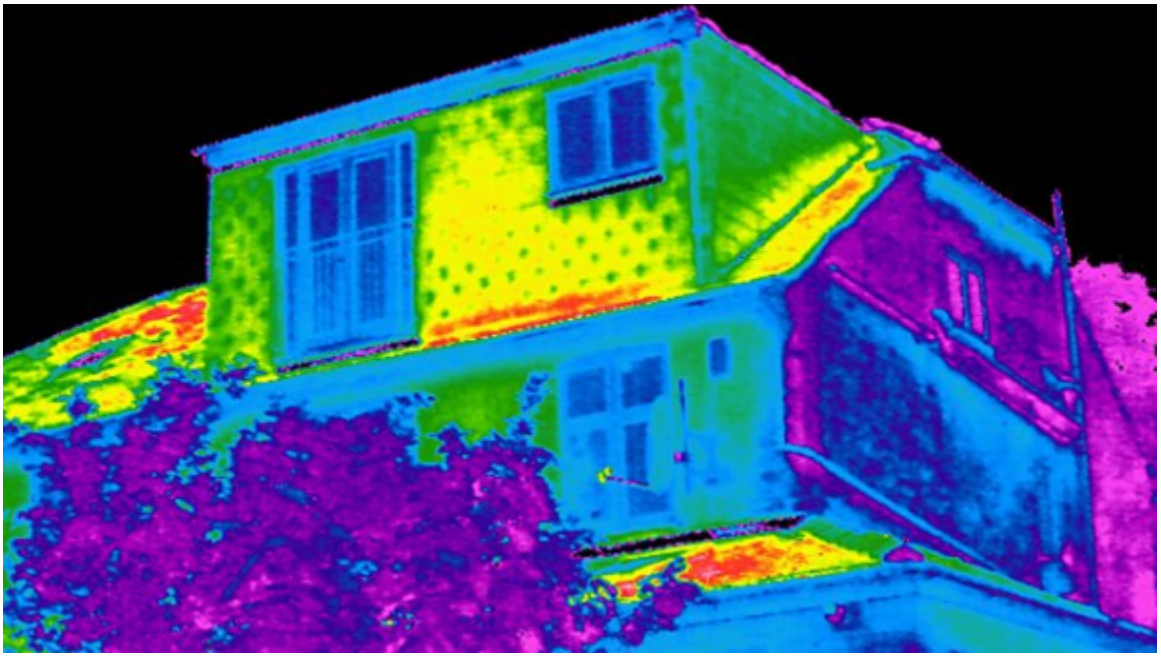

How energy efficient are our homes?

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What's the story?

More than **12 million domestic properties** across the UK fall below the government's long-term target to make homes energy efficient. That represents almost **two thirds** of all households that hold an energy performance certificate.

It means UK householders are spending billions more on energy bills and are pumping millions of tons more CO2 into the atmosphere than necessary.

An Energy Performance Certificate provides a grade between A and G for how efficient a property is. An A grade indicates lower energy costs and better insulative measures. A Grade G is at the other end of the scale. C is just above average.

The government had set a target of making ***all homes*** in England and Wales the equivalent of an Energy Performance Certificate (EPC)[1] "C grade" by 2035[2], but critics say moves towards achieving that "have fallen off a cliff".

Almost a fifth of all CO_2 emissions are generated by domestic properties, mainly due to the dependence on gas for our heating and cooking. But the energy efficiency of our homes (how well they are insulated, glazed, or use alternative measures to reduce energy use) also has a major impact on emissions.

The government launched a consultation on a new building standard for homes, which it hopes will address some of these issues, but with 90% of the existing housing stock built before 1990, there is a growing need for retrofit measures.

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[1]An Energy Performance Certificate provides a grade between A and G for how efficient a property is. An A grade indicates lower energy costs, better insulative measures. A Grade G is at the other end of the scale. C is just above average.

[2] There are different targets for Scotland - all targets are set out in section 8.

What is an energy performance certificate?

EPCs are designed to measure the efficiency of a house by looking at how well a property is insulated, glazed, or uses alternative measures to reduce energy use. Homes are given a grade between A and G. The closer to A the more efficient the home, meaning it should have lower energy bills and a smaller carbon footprint.

England's stated ambition for all homes to meet the EPC "C" standard by 2035.

The EPC process looks at several things, including:

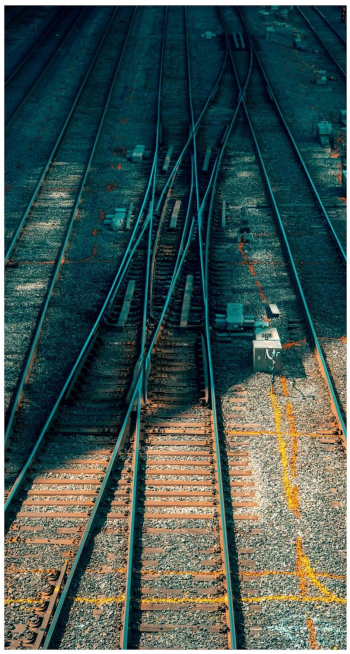
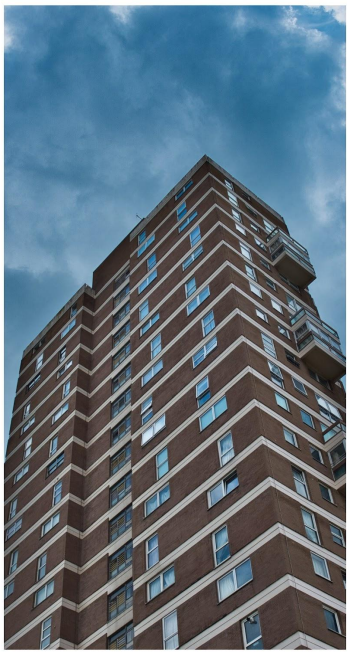
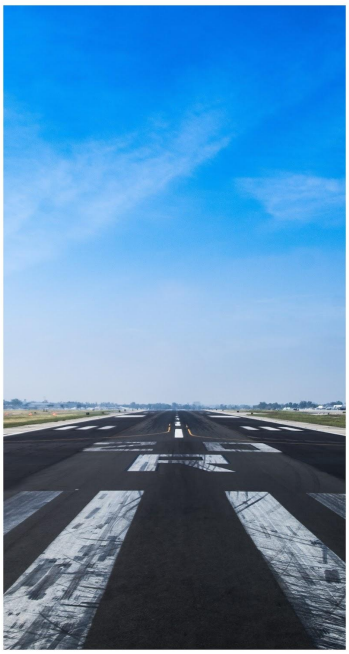
For the EPC homes are rated on:

- Energy efficiency - looking at the cost it takes to keep a home warm, to provide hot water and lighting
- The current CO2 emissions
- The type (if any) of double glazing
- Whether the home has wall and roof insulation
- The type of fuel used for heating - e.g gas
- Whether renewable energies are in place - e.g. wind turbines, solar panels.

There is already a legally binding target of upgrading all households in Fuel Poverty by 2030 but campaign groups say the government does not have the arrangements in place to actually meet those targets.

The BEIS select committee described progress as slowing "to walking pace". It says the average annual rate at which homes undertake energy performance improvements in the UK needs to increase by a factor of seven.

What subsidies are available?

Responsibility for energy efficiency is administered separately by the Welsh and Northern Irish Assemblies and Scottish Parliament. England falls under the jurisdiction of Westminster.

Currently no direct taxpayer money is spent on support for energy efficiency measures in England. Financial support for this now falls under the Energy Company Obligation where the energy companies are responsible for installing energy saving measures in homes. The Energy Company Obligation is a government programme where energy

firms fund the installation of energy efficiency measures, based on targets given to them by the Government. The scheme is administered by OfGem.

Scotland and Wales do provide additional funding for energy efficiency measures – including low interest loans for those with ability to pay and free measures to low income households at risk of fuel poverty. Scottish LA's also have their own schemes. Wales is broadly the same.

According to fuel poverty charity, National Energy Action, progress was made on installing energy efficiency measures until 2012. Since then there's been a 95 per cent drop in the rates of improvements (insulative or energy efficiency measures) being carried out.

What the pack contains:

We sourced data from a variety of sources including the UK census and open data on EPC certification, as well as looking at information from the various nation housing surveys.

We extracted a series of measures for each local authority in England, Wales and Scotland to determine:

- For each local authority area, the number of homes in each EPC band
- The proportion of homes currently falling short of the government target to make homes energy efficient (homes currently in the D to G bands)

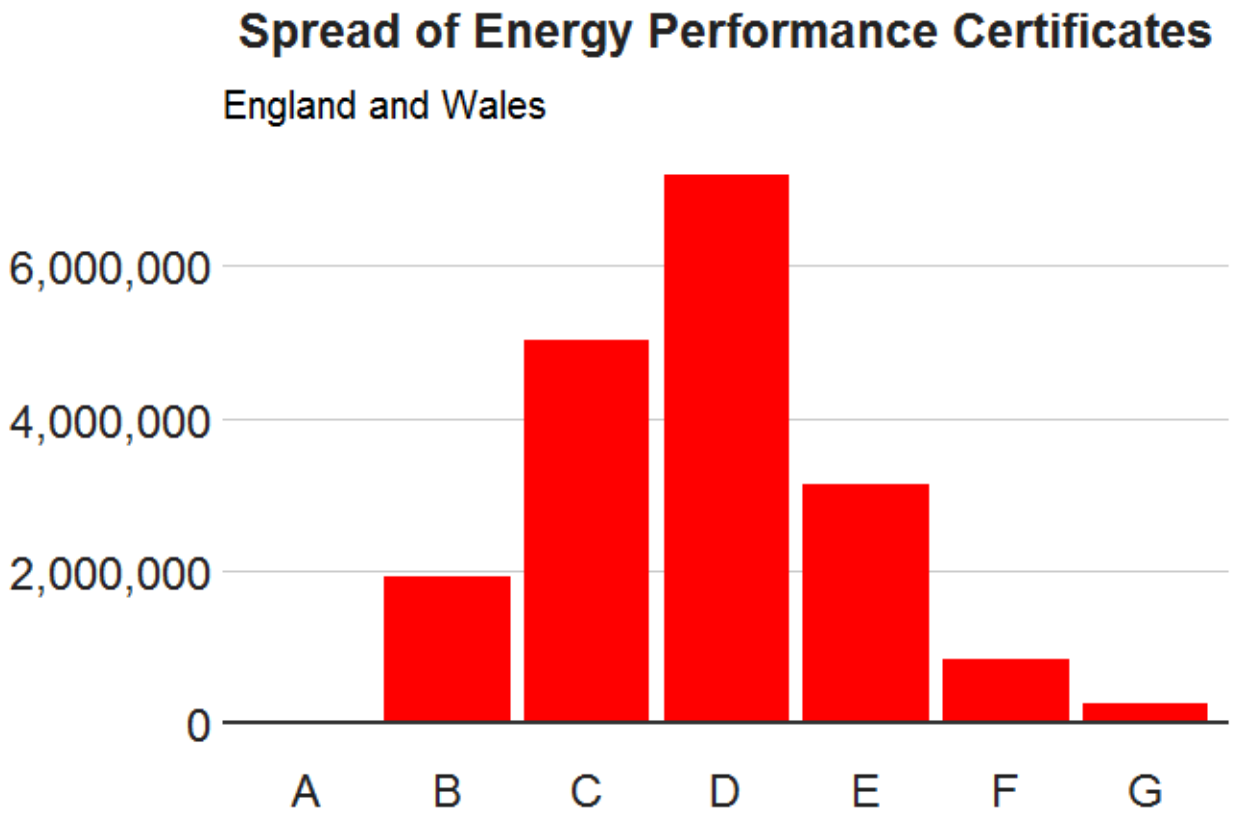
Our findings

England

- 17.6 million homes have an energy performance certificate
- 10.8 million homes (62%) have ratings of D to G

Wales

- 960,000 homes have an energy performance certificate
- 646,000 homes (67%) have ratings of D to G



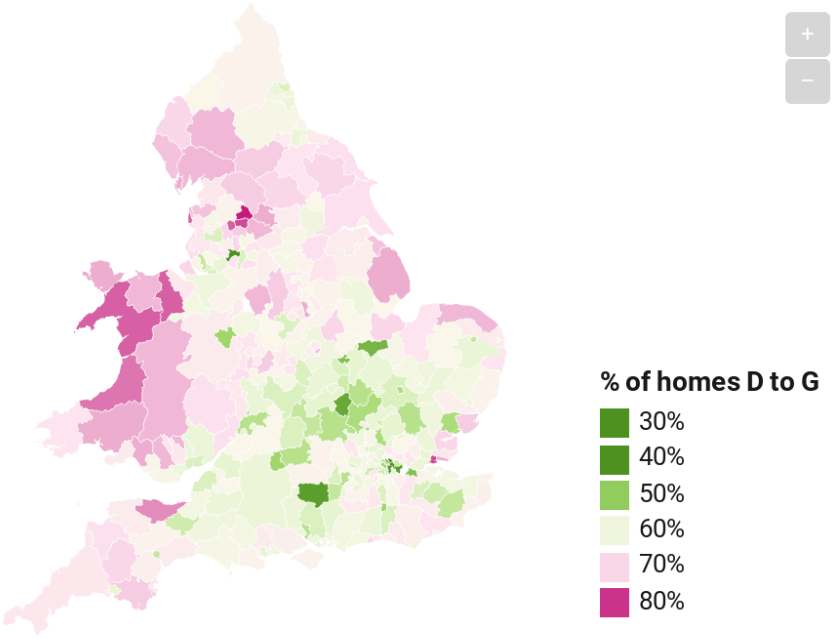
Scotland

- 903,000 homes have an energy performance certificate
- 531,250 homes (59%) have ratings D to G

Northern Ireland

- 499,570 homes have an energy performance certificate
- 333,600 homes (67%) have ratings below D to G

How energy efficient are the homes in your area?



Source: BBC Shared Data Unit • Map data: © Crown copyright and database right 2018 • Created with Datawrapper

How to use this data pack:

COLUMN	DETAILS
A: ONS LA CODE	ONS codes used to identify every council in the UK
B: REGION	The region the council is located in, e.g East Midlands, West Midlands
C: LOCAL AUTHORITY	The name of the council

D-J: GRADES	The number of properties registered as that energy performance certificate grade
K: TOTAL PROPERTIES WITH ENERGY RATING	The total number of households for that local authority that had an energy performance certificate
L: NUMBER OF PROPERTIES RATED D-G	The total number of properties in that local authority with a D-G grade certificate
M: % PROPERTIES D-G	Of those registered, the percentage of properties registered D-G (Column L/Column K)
N: AVERAGE CO_2 EMISSIONS	Average CO_2 emissions (on sampled data) per house per year (tonnes)
O: POTENTIAL SAVINGS	The average estimated cost savings for heating, lighting and water bills if properties underwent all possible improvements (such as cavity wall insulation). Savings are annual for England and Wales and over three years for Scotland and Northern Ireland

Note:

Northern Ireland: Carbon emissions in Northern Ireland were recorded differently before 2009 so we excluded these figures from our calculations (column L of the Northern Ireland tab in our data).

What the experts say (summary):

Jenny Hill, team leader for buildings and International action, Committee on Climate Change

“We need to implement a huge efficiency drive and switch away from a dependence on fossil fuels.

“There are 29 million homes, all of those need to retrofit energy efficiency measures and better forms of heating, and as we are looking to achieve this by 2050, that implies upgrading a million homes a year, but the current rate is 10 times less than that.

“It’s crucially important that we have an attractive package for householders. People are much more likely to consider energy efficiency measures when they move home or do renovations, for example we could reduce stamp duty on efficient homes.”

Peter Smith, Director Policy and Research NEA

Peter Smith, Director Policy and Research NEA said that low income earners were more likely to be living in low energy efficient homes and improvements to those homes could save a ‘life-changing’ amount in fuel costs.

“At a high level - housing needs to become an infrastructure priority. There needs to be a push to improve all homes, but to do this it needs to have the same infrastructure priority as HS2 or building a third runway, rather than something delivered through departmental spending.”

Tim Forman, Centre for Sustainable Development, University of Cambridge

Dr Tim Forman, a research academic at the University of Cambridge's Centre for Sustainable Development, said now only a national project of a scale not seen since World War Two, would

be enough to help Great Britain meet its 2050 net zero carbon target, which was signed into law in June 2019.

Dr Forman said: "We need to throw everything we have at it [energy efficiency].

"There's a desperate need to do something, not in 10-15 years, but now."

Kim Ratcliffe, resident Erneley Close, a former council estate retrofitted to Passivhaus standards in Manchester

“I would say that [before the refurbishment] the place looked derelict, that’s how bad it was. The state of the homes made a lot of people ill.

“When we got back it was like dreamland. We just loved it, it’s brought us together and there’s definitely a sense of community pride. It was a real change.

“In the past we had to use fan heaters because it was so cold and because we could not afford to put on the radiators. We would get through £12 -£13 a day just to run the heaters.

“I have never had to put the heating on since it has been redone.”

Dave Williams, Executive Director of Assets and Growth, OneManchester

Describing the project to retrofit Erneley Close, Manchester, as part of a wider programme to improve home efficiency:

“Our customer base is drawn from some of the most vulnerable people, fuel poverty is a real issue for them. We want to make these homes viable in the long-term.”

David Wetherall Energy Savings Trust

“In England there is no direct taxpayer spending on energy efficiency, [it’s a] very different case in Scotland, Wales and Northern Ireland.

“In Scotland there’s a very joined up approach to energy efficiency, if you’re able to pay, the Scottish government will give you a zero interest loan up to £38,000 to make changes to your property, and if someone is on a low income or at risk of fuel poverty they can access help through fully funded installations of measures like the installation of a new boiler or cavity wall insulation”.

John Palmer, Research and Policy Director , Passivhaus

“Developers aren’t interested in running costs, they build it and walk away. Local authorities and housing associations are, they have a vested interest in keeping running costs as low as possible for themselves or for tenants.”

“Government intervention could help retrofit. Householders have to suffer the inconvenience and the time it takes to carry out the work. An innovation fund to help minimise that would be useful.”

Dustin Benton, Green Alliance

“We estimate that £1.3bn a year could help drive the market in carbon reduction measures. Of this £300m would act as an innovation fund. It acts on the premise that the Government will provide money under the proviso that companies work to make retrofit cheaper, you will get government support but only if you help bring down costs.”

On fuel poverty:

“Often people will live in one room during winter because they can only afford to heat one room, eventually this can lead to health problems. The NHS had a boiler on prescription service. During winter people often try to access hospital, it’s warmer, but hospital beds are expensive, this was a more cost effective way of keeping people in their own homes.

What the experts say (full quotes):

Jenny Hill, team leader for buildings and International action, Committee on Climate Change

“What is clear is that it is not possible to meet our net zero ambitions without getting homes all the way to near zero in terms of carbon emissions. We need to implement a huge efficiency drive and switch away from a dependence on fossil fuels.

“We are looking at electrification-based solutions. Heat pumps which may not be fairly familiar to UK citizens as they are not as common here as in Italy or France. Heat pumps are three times more energy efficient than a traditional gas boiler.

“Then we have decarbonisation measures, like district heating schemes are heating systems across multiple homes, and are a good solution for cities, it gives you the ability to pump heated water between buildings, for space and water heating. This might be drawn from industrial processes. It can be very efficient, it’s much easier to store heated water than for example, battery storage.

“In Denmark, for example, there is much greater levels of heat networking. 40% of its heating demand is met through heating networks.

“There are 29 million homes, all of those need to retrofit energy efficiency measures and better forms of heating, and as we are looking to achieve this by 2050, that implies upgrading a million homes a year, but the current rate is 10 times less than that.

“Passivhaus and Energiesprong are very ambitious in terms of the role they see for energy reduction. It's a very attractive option for new buildings. We have recommended a new building “standard be introduced by setting 2022 wants a benchmark set for space heating of 15kwh per m2 per year, that’s in line with Passivhaus.

“With retrofit, it’s all about transforming the building into a lower level of demand. The energiesprong approach is equally focused driving energy demand all the way down. And the benefits are things like reduced energy bills, improved air quality, health, comfort etc. At the moment this could not be scaled across the whole housing stock unless costs are driven down.

“There is huge scope for innovation in other areas, such as business models. The energy systems catapult is trialling a model where they are offering heat as a service. Trialling with more than 100 homes, offering different packages for householders to pick from.

“In terms of differences between the UK and Europe, there has been an historical context and availability of natural resources that the UK had at its disposal, for example north sea gas.Other countries didn’t have access to those opportunities.

“Denmark during the oil crisis of the 1970s was pushed to look at alternatives. It went down a planned economy route and took an area by area approach. It looked at each area and carried out an appraisal on whether it was suited to a district heating network or should be on a gas grid, and, whichever was the cheapest option they went for.

“The Netherlands is an interesting case. Like the UK they have an extensive gas network and they are also grappling with the problems of decarbonisation.The Dutch government have developed a radical plan, it is area based and they are piloting 100 gas-free neighbourhoods, working alongside local authorities and residents to work through what they want to see in terms of energy, transport etc. This is matched with central government support.

“Something that absolutely needs to be put in place as soon as possible is energy efficiency in homes that cannot apply for the energy company obligation. Since the Green Deal there has not been a policy in place to drive that market. Energy efficiency measures in that area have fallen by 95%.

“It’s crucially important that we have an attractive package for householders, that tie in with 'trigger points'. People are much more likely to consider energy efficiency measures when they move home or do renovations, for example could we reduce stamp duty on efficient homes.

“We also need better consumer standards. Peter Bonfield has done some work on this - a report called Each Home Counts. It found that there is a huge fragmentation of skills and supply in the building industry and retrofitting can be hugely confusing to householders when it comes to meeting standards and having confidence in companies doing the work.

“Among the recommendations in that report is the need for a quality mark, better training, providing good quality bespoke advice and a retrofit coordinator to oversee the projects. This could still be a few years off.

“It highlights the need for improvements that would be industry wide. It is about incentives and trajectory of standards, regulation has an important role to play.

“Incentive schemes are great but aren’t comparable to having a robust legal standard in place. That’s what gives the market confidence that demand will be there in the long term. It makes them willing to invest in jobs and skills.

“In Britain around 20,000 heat pumps are installed each year, but those who install them need to be trained, it costs £1,000 for the training, training which has to be renewed annually.

“We need a joined up approach, to be more efficient we need to avoid repeating costs - there are search costs, hassle costs, work costs - and there’s only a limited number of opportunities to do that.”

Peter Smith, Director Policy and Research NEA

“Each winter 11,000 people die each year due to cold homes. During the Beast from the East, Brits were 10 times more likely to die from a cold home than from a road traffic accident.

“There is some degree of overlap between low income earners and those living in low energy efficient homes. The government issued a new measurement in 2012 called the low income, high costs which showed a high correlation between fuel poverty and energy efficiency.

“People that have an income of 60% of the median income (equivalent to around £12,000) are often living in the most expensive homes to heat. Energy efficiency also brings added benefits including public health, air quality and lower pollution.

“There’s definitely a rural/urban split, especially In rural off gas areas, they tend to live in the least energy efficient housing,which tends to be older and uses fuels like LPG or solid fuels. They are also more likely to have solid walls which are difficult to insulate.”

“Support has been directed towards the Energy Company Obligation - it was supposed to be directed towards lower income households. But the scheme gives full discretion in their choices to the Energy Companies. So, they tend toward householders with more ability to pay something towards the cost. What that does mean is that the government is not delivering on their pledge to deliver to the worst first.

“There is a rural safeguard, which means suppliers have to deliver 15% of obligation to rural areas, but the definition of what is a rural area is really broad. It’s defined as 10,000 dwellings or less - so that could go to small towns rather than villages and hamlets or more isolated areas so it doesn’t reach the areas which really need it.

“In terms of social housing, there have been a number of schemes aimed at helping lower income families out of fuel poverty - the bigger challenge is actually with owner occupiers and the rented sector.

“For example, people in the 1980s and 1990s who bought their house under right to buy, those people that did that are still strapped for cash and therefore have no money to improve their homes.”

“At a high level - housing needs to become an infrastructure priority. There needs to be a push to improve all homes, but to do this it needs to have the same infrastructure priority as HS2 or building a third runway, rather than something delivered through departmental spending.

“Fuel poverty households living in the least Energy Efficient homes might be needing to find £2,000 ***above*** the average energy cost for the rest of the country. If we were to make improvements to their homes, the savings would be considerably more than outlined in your average savings. We are looking at something around £1,500, that’s a life-changing amount.

“Those households living in rural areas are least likely to have access to the internet, so if they are offline they are less likely to be able to benefit from more cost effective deals, unable to benefit from cost savings linked to going paperless. The rollout of super fast broadband, if that pledge actually takes place, could have a positive impact on fuel poverty.

“There’s also a real issue with things looking like they are too big to solve. Before 2012 we were doing a remarkable job in tackling Energy Efficiency, it’s only since 2012 that it has fallen off a cliff, it is not beyond the wit of man to get bus back on track. A lot depends on it becoming a political priority.”

Tim Forman, Centre for Sustainable Development, University of Cambridge

“Energy consumption in housing looks to be on track to increase by something like 29-34% over the next 15 years, it is heading in the wrong direction.

“We do have technical solutions, but there are a number of challenges with the supply chain that need to be addressed, but this a challenge of leadership.

“There needs to be a stable environment for companies set up to fulfill energy efficiency measures to thrive, without stability and trust in programmes this won’t happen. For example the Feed-in Tariffs (FIT) scheme was designed to promote renewable and low-carbon electricity generation technologies.

“Companies set up around the FIT programme to install photovoltaic funded by the scheme, but they suddenly had the rug yanked out beneath them when the scheme was ended, their whole market collapsed. Similarly there was a lot of excitement when the Green Deal was launched, but this again collapsed due to the unfavourable financial terms which failed to drive take up. Industry ramped up to support the policy, but facing no more market they are forced to fold or transition to other businesses. We have created instability across the industry over a lack of trust. They all need faith to act, but quite tragically we seem to have undermined that and faith is an at all time low.

“We need to move away from single measures, for example photovoltaic installation, it would actually be more effective to look at the whole house at once.

“There is an old strategy Be Lean, Be Clean, Be Green. Be Clean involves looking at energy demand, and the impact of air tightness, insulation values, it can help create a more efficient building, saving energy usage on heating, lighting etc.

“Being Clean, that’s looking at the heating infrastructure, perhaps looking at connections to a domestic heating network, being green might mean looking at renewable technologies such as air sourced heat pumps.There is well-evidenced cost efficacy of that approach, which is well-established. The problem is one of efficiency of scale.

“Area focused schemes meet this problem by upgrading 2-300 houses at a time. These housing projects tend to target single measures, and tend to be rolled out on social housing

neighbourhoods, across homogenous housing stock, it's easy to target, but is only a fifth of all housing stock.

"The challenge is dealing with different housing types, which are geographically not co-located grows exponentially.

Do we know which homes are the problem, which need to be targeted? Only 0.1% of domestic stock has real energy data monitoring. If you can't measure a problem, you can't solve a problem. There has been an attempt at smart metering, the idea being that if you have smart metering you would moderate usage, but that has stalled.

"There's also no real plan as to how to use this data. We need to be able to study the problem at scale, social housing and local authority sector have the potential of being able to deliver that.

"We just don't know what we are dealing with, we don't have any degree of granularity which homes we are dealing with or how to stop people simply turning up the thermostat.

"You can achieve a 10% saving in energy usage by simply turning down the thermostat by 1 degree. We need to educate homeowners.

Can we change behaviour by what our neighbours are doing? If we see that Mrs Jones has made huge savings by using less energy would we follow suit?

"Focus on behaviour is at the top of the cost hierarchy, programmes like FIT are needed but might be considered foolhardy when look at Be Lean, Be Clean, Be Green.

"The ambition is to have a real long-term stable modification of behaviour. It is a hard solution to be quantifiable and stable over time as behaviour is only a good policy for as long as people are doing what you need them to do.

"Public service advertising would help, it is probably more effective than spending on hard infrastructure. Also you need quality, reliable information. Quality of reliable information services has been hit through spending cuts. You need a definitive advice programme.

"The heating of domestic buildings represents the largest opportunity to reduce CO_2 emissions in this country. There's a desperate need to do something, not in 10-15 years, but now.

"You have to look at World War Two, or the US moon shot of the 1960s to find a proper predecessor for what we need now, mobilising a country's effort behind a single goal. The moon shot was a drive toward technical innovation, we need to do that with energy efficiency, we need to throw everything we have at it.

“There has to be that unifying goal, that we want to land on the moon. There needs to be government support towards that goal in term of grant support, but also creating stability and trust. The Government has to outline a way forward to achieve it.

“The numbers are almost impossible to give in terms of cost. You could be looking at anything between £5,000 and six figures for adequate retrofit measures, depending on the age and nature of the individual property the cost could be anything between £18,000 and £150,000.

“With our attitudes to climate change we can’t realistically hope to see these changes through voluntary actions. Social Housing providers are willing to take energy efficiency and carbon reduction measures as it is in their best interests, it gets much trickier when you look at the private sector and even trickier when you look at the private rented sector.”

Kim Ratcliffe, resident Erneley Close, Manchester

“Erneley Close was our first home together, and I would say that [before the refurbishment] the place looked derelict that’s how bad it was. On the balcony we had pigeon poo that was so thick it was ankle deep.

“You daren’t open the window, I did once and a sheet of glass fell out the putty was so poor. It was also that cold. I like to have the window open a little, but you’d have a pigeon on your couch.

“The state of the homes made a lot of people ill, but when they said the were going to do the place up to this standard, we didn’t expect it, no. When we got back it was like dreamland.

“They promised a lot of things and they lived up to it. Because they did so much we wanted to really look after our properties. We just loved it, it’s brought us together and there’s definitely a sense of community pride. It was a real change.

“It’s now a lot cheaper for electricity, we don’t have gas as it’s a passivhaus. In the past we had to use fan heaters because it was so cold and because we could not afford to put on the radiators. We would get through £12 -£13 a day just to run the heaters. We got portable heaters to take into the bathroom just to have a bath.

“I have never had to put the heating on since it has been redone. It’s a nice heat. I used to suffer from asthma, but now when I come in from the cold, I’m never short of breath, we’ve got clean air.

“Everything has made a difference, but especially the heating and the look of the property, you really want to look after it. We’re proud of it.

“The rent has gone up a little bit, but the heating bills are so much lower that it’s still saving us money. It’s put Erneley Close on the map, everyone has heard of us now. It used to be so cold here that some days you just wouldn't get out of bed.

“I hope they build more places like this, we’ were filmed a while ago. We’ve had people from China and Germany visit us to find out about it. We’re happy to have them because we are all so proud of it.”

Dave Williams, Executive Director of Assets and Growth, OneManchester

Describing the project to retrofit Erneley Close, Manchester.

“It was a former council estate, which came to us in a stock transfer in 2009 from the city council.

“We had a five year project called the ‘Decent Homes’ Programme, which all linked in with the stock transfer of Erneley Close. We also had an energy efficiency strategy, designed to improve the energy efficiency of all of our stock. Some were fairly simple measures, replacing the kitchens, and windows, installing insulation etc, but we thought ‘can we take this a step further and build in additional efficiencies while we were doing that?’

“Essentially, what additional value could we get while implementing the Decent Homes programme.

“We looked at our entire stock and looked at what was needed in each area. We thought about what was coming in the future, the whole climate change issue and the need to decarbonise. We have a 30-40 year business plan and, even back then, we knew we needed to do more to make sure the stock would be fit for purpose.

“One thing we wanted to test out was how we could get to a very high level of insulation, our research led us to Passivhaus, which had been mainly used for new builds.

“We chose that stock [Erneley Close] because it was some of the worst we had,and it did lend itself to doing something that was better than basic. We wanted to use it to develop a toolkit for what we could do in the future.

“From memory the enerphit element added around 20% to the overall costs. In comparison we have just completed a near Passivhaus new build scheme (obviously without the retrofit challenges) which we estimate has a 5% cost uplift – and the more we do the lower the cost uplift will be.”

“Our customer base is drawn from some of the most vulnerable people , fuel poverty is a real issue for them. We want to make these homes viable in the long-term.

“The waiting list in our area for affordable housing is up near 20,000, so for people seeking affordable housing there’s high demand, this was not about doing work to stop homes being left empty, it was about reducing fuel bills for people.

“One of the issues we are facing is moving away from gas. Electricity costs four times more than if you were getting gas from the grid. By 2025 new builds won’t be using gas”

“If we are moving to something more expensive, that’s an issue for our customers. A phrase we hear a lot is ‘heat or eat’, and for many of our customers that is really important.”

David Wetherall Energy Savings Trust

“The difference between England and Scotland is how things are structured, there is another level of spending. In England there is no direct taxpayer spending on energy efficiency, very different case in Scotland, Wales and Northern Ireland.

In Scotland there’s a very joined up approach to Energy Efficiency, if you’re able to pay, the Scottish government will give you a zero interest loan up to £38,000 to make changes to your property, and if someone is on a low income or at risk of fuel poverty they can access help through fully funded installations of measures like the installation of a new boiler or cavity wall insulation”.

“Access is through a single point of contact, called Home Energy Scotland, it is a very integrated approach. The targets are less ambitious than in England but Scotland has done more to work towards its stated target”

John Palmer, Research and Policy Director , Passivhaus

“Four years ago we saw the pioneers, the Grand Designs-style projects, bespoke one-off buildings. Those projects raised interest in Passivhaus, galvanized supply chains.
Now we are seeing an interest in low energy, low cost homes from local authorities and housing associations.
Developers aren’t interested in running costs, they build it and walk away. Local authorities and housing associations are, they have a vested interest in keeping running costs as low as possible for themselves or for tenants.”

“In terms of new build if you believe figures from the UK Climate Change Committee then £5k over the build costs for an average building regulations home is easy to achieve, you could legislate to do that. Barrett makes around £50,000 profit on each home, so £5k off that is nothing. Something along those lines features is in the Future Homes Standard.”

“Government intervention could help retrofit though.Householders have to suffer the inconvenience and the time it takes to carry out the work. An innovation fund to help minimise that would be useful.”

“We could also do with finance innovation. Only the Ecology Building Society and Barclays offer better mortgage deals for energy efficient housing. The Green Deal was in this space, but while Green Deal interventions were low, what was interesting was that 3-400k assessments were done, that shows there was interest there.

Local authorities could be a driver. They have a genuine mandate from members to do the right thing, build Energy efficient homes that are cheap to run. I can only see this increasing. Will we see the private sector follow their lead? At the moment there is no incentive to do so, there’s not enough evidence to suggest that they’ll make more money from a Passivhaus, but as that changes the market will respond.”

Dustin Benton, Green Alliance

“There does tend to be lower urban energy consumption than in the countryside. In terms of housing, buildings tend to be closer together, the building types tend to be tower blocks or terraced housing, so they share a party wall - it helps to retain heat, and there is less exterior of the building to lose heat through, than in rural areas.

“I don’t think that there are in terms of materials there are different standards, though it is fair to say that London has higher standards for new buildings than other parts of the country. For example the borough of Merton now requires an element of on site renewable energy in all it’s new housing.[3]

“Affluence has a direct impact on energy usage - rich people use more carbon because they can afford to heat their homes. Buildings with cavity walls are very cheap to insulate, the chances are that if a house was built between the 1950s and 80s, almost all of them will have cavity walls. With subsidy it will cost as little as £600 and that could change an EPC Grade E to a Grade B.”

“Energiesprong[4] is effectively a new shell around an existing building, which also includes a solar pv roof and an integrated modular heating system which can also provide energy back to the grid. In effect this approach can turn an EPC standard Grade G into a better than Grade A home. It is very effective and can reduce emissions by more than 70%

“Energiesprong is more efficient as a building method. Much of the facade can be built in a factory. Though currently the cost of its retrofit is around 60-75k It’s attractive as a long term solution as we believe they can drive costs down through technical innovation

“We estimate that 1.3bn a year could help drive the market in carbon reduction measures. Of this 300m would pay for Energiesprong projects - that money would act as an innovation fund. It acts on the premise that the Government will provide money under the proviso that

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[3] The London Borough of Merton was the first local authority to formalise the Government's renewable energy targets in its Unitary Development Plan. The council pledged to provide at least 10% of the energy needs for all its new major developments from renewable energy technologies - Building Research Establishment

[4] Energiesprong is a programme which installs energy efficiency measures by installing an energy efficient façade around a property, a solar panelled roof, and an energy hub, with air or ground source heating and optional batteries. It is claimed the cost is covered by energy savings and reduced home maintenance costs.

companies work to make retrofit cheaper, you will get government support but only if you help bring down costs.

“This is the same method which was taken for the renewable energy industry.
Offshore wind knew it needed to be more competitive and knew it needed more money to do so. With Government support it went from £155 per KWh to £40 KWh - a huge change. It did so through innovation. The same thing could happen in this sector.”

On fuel poverty:

“Often people will live in one room during winter because they can only afford to heat one room, eventually this can lead to health problems . The NHS had a boiler on prescription service, in which the NHS would pay for basic new boiler to heat homes. The tradeoff was that people didn’t end up in hospital. During winter people often try to access hospital, it’s warmer, but hospital beds are expensive, this is a more cost effective way of keeping people in their own homes.”

On jobs:

“Standard retrofit measures can be quite labour intensive. Innovation that drives costs down would also reduced the amount of labour involved, but this isn't necessarily a bad thing. Factory buildings for this type of manufacturing tend to stay in an area for a long time, that is a long term guarantee of jobs. Traditional construction tends to be more casual. Factory jobs also tend to be better paid. There’s an element of Upskilling, so overall it could improve the job situation.

A spokesperson for the Department for Business, Energy and Industrial Strategy said:

“Residential emissions have declined by 14% since 1990, but we need to go much further and faster to improve the energy performance of homes if we are to eliminate the UK’s contribution to climate change completely by 2050.

“That is why we are investing over £6 billion to bring as many houses as possible up to EPC C by 2035 and, from next month, landlords will no longer be allowed to rent out the least energy efficient homes. We are also exploring how to halve the cost of retrofitting properties and investing over £320 million into helping heat homes with lower carbon alternatives, such as heat networks and heat pumps.”

Further notes to editors from the Department for Business, Energy and Industrial Strategy:

- The Energy Company Obligation has already improved efficiency in over two million homes, stopping 48 million tonnes of CO2 from polluting the environment - the equivalent to the annual emissions of 21 million cars. It’s delivered savings worth £12.6bn to low income and vulnerable households.
- The Future Homes Standard requires all new build homes to be future-proofed with low-carbon heating (without gas boilers) and world-leading levels of energy efficiency from 2025. We will also consult on improvements to Building Regulations to ensure as many homes can reach EPC C as possible.
- Since 2018, we’ve introduced rules which require landlords to improve the energy performance of the least energy efficient homes. Landlords have until April this year to improve the energy performance of privately rented homes to EPC Band E or above, or register an exemption where one applies. Non-compliant landlords will face fines of up to £5000 per breach of rules per property.
- £10m is being invested to pioneer innovative approaches to bring down the cost of whole house retrofit of homes, ultimately aiming to halve the production and installation costs by scaling up the outcomes.

- We have launched the £5m Green Home Finance Innovation Fund to support the development of innovative green finance products that enable homeowners to make energy efficiency improvements to their homes.
- We are investing £16.5m to investigate the potential for a large-scale role of heat pumps by trialling them in 750 homes.
- Over a third (39%) of people recently surveyed say they are aware of the need to retrofit homes say they are deterred by up-front cost. However, improving the energy performance of a home can save a household up to £300 a year on energy bills.
- The government has committed to publishing a Heat and Building Strategy later this year, setting out the immediate actions we will take for reducing emissions from buildings. There are a number of options that could play an important role in decarbonising heat, including heat networks, heat pumps, hydrogen and biogas - a mix of technologies will need to be available to decarbonise heat at scale.
- BEIS is investing £320 million into heat networks in England and Wales up to March 2022 to accelerate the growth of the market. As part of this, thousands more homes in Leeds, Bristol, Liverpool and London now have access to low-carbon heating.
- We are also investing over £100m in hydrogen innovation, including a project with Hy4Heat, who are working with boiler manufacturers to see whether it's possible to develop prototype

Notes on data:

1. This data was collected using data from the EPC certification scheme.
2. The data set only includes homes which were granted an Energy Performance Certificate - not all homes will be included.
3. Data for potential savings was calculated by taking the current heating, lighting and water bill costs for individual properties on the EPC register and comparing those with the potential energy costs for that property after all possible home improvements (such as loft insulation or double glazing). Some home improvements are not possible due to the structure of some properties. Figures were then aggregated by local authority area. Potential savings for homeowners in Scotland and Northern Ireland were provided in the source data over a period of three years.

4. Data for Scotland was collected differently. The dataset was part anonymised meaning it was not always possible to show all homes that lay within distinct local authority areas. As such the row labeled ‘overlapping areas’ is a collation of figures for postcodes which could fit in two or more LA areas. The dataset was also for a slightly different time period (the last quarter of 2012 through to the end of 2016).
5. Data for Northern Ireland was not freely available. The data was provided to the BBC in an aggregated format after the postcode matching process, presented by local authority. As for Scotland, postcodes with no applicable local authority area were designated as ‘overlapping areas’.
6. Carbon emissions in Northern Ireland were recorded differently before 2009 so we excluded these figures from our calculations (column L of the Northern Ireland tab in our data).
7. The image on the front page is from the Science Photo Library. All other images were created in house by the BBC.