



Warm homes into the future
Meeting the UK's energy challenges



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A UNISON report investigating the multiple benefits of national domestic energy efficiency programme

Foreword

The UK faces some significant energy challenges in the years ahead if we are to ensure the lights stay on, homes are kept warm and environmental obligations linked to climate change are respected.

As it stands we are some way from having the level of assurance many would be comfortable with and bolder action is being called for to reflect the scale of challenge.

The UK has relied heavily on the supply of indigenous gas to heat homes and provide electricity and this supply is running out. It will leave us more dependent on overseas supply which is less secure and less price stable. At the same time we have stubbornly high rates of fuel poverty and we are failing to meet our environmental targets on emissions.

On the security of supply front, the government's answer is to try and fast track the development of shale gas through wide spread fracking which itself has raised many environmental concerns.

At the same time the UK has the one of the oldest housing stocks in Europe which is leading to large amounts of energy being wasted through inefficient domestic homes. These homes are some of the least well prepared in Europe to absorb future price increases causing yet more misery for householders.

Putting all these concerns together UNISON has sought to find a suitable policy response that would address the many concerns in a pragmatic and considered way. We have considered the wide range of studies into this subject matter and responded by producing this report, highlighting the key issues, ways forward, associated cost and how these costs might be found. It concludes with a series of strong recommendations which UNISON is calling on the government to action without delay.

Matthew Lay
UNISON national officer
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Preface

This UNISON report provides compelling evidence that addressing domestic energy efficiency issues in a comprehensive and systematic way is the most viable policy approach we can take, in addressing the multiple energy challenges the UK faces.

To delay further such an approach would be to ignore the compelling evidence presented and compound the human misery caused by fuel poverty. It would also prevent the positive opportunities available to create and sustain economic growth and address the pressing energy supply concerns.

The report draws on extensive research carried out by; Energy Bill Revolution, Prashant Vaze, Association for Conservation of Energy, Institute of Public Policy Research, Consumer Focus, Verco amongst others.

The evidence in this report demonstrates the true extent of the many challenges we face;

- The UK has the oldest housing stock in the EU
- These older homes require at least double the energy consumption to stay warm when compared with other similar developed nations
- UK householder's spending on energy has doubled since 2003 from £15 billion to £32 billion
- UK households account for 61% (and rising) of total UK gas consumption
- We are fast running out of indigenous gas supply and by 2020 may need to import as much as 70% of demand.
- The ONS calculate that excess winter mortality in England and Wales in 2012/13 rose 29% from a year before at 31,000 deaths
- 5 million households are suffering from fuel poverty with the poorest households spending much more of their income on keeping warm than the richest households
- The UK has a legally binding target of reducing carbon emissions by 34% (1990 base) by 2020, 60% by 2030 and 80% by 2050. It is struggling to meet these

UNISON is demanding change and serious action now, to

address these challenges. Responses so far have been less than adequate. The governments approach has largely failed in making the inroads that are required to deal with the extent of the challenge and further delay in doing so appears to be the policy of the day.

UNISON believes the way forward presents itself in the form of a national programme of energy efficiency measures that ensure that every UK domestic property complies with the Energy Performance Certificate (EPC) at Band C. This programme could be delivered universally to all householders on a door to door basis over a 15 year period. So UNISON is calling on the government to take the following action without further delay;

- Ensure every UK home is classified according to its Energy Performance Certificate via a national free door to door assessment programme, which identifies the remedial works required to meet the EPC band C standard
- Ensure that a national publicity campaign is launched explaining the national benefits of the programme and the details of how to access the remedial works
- Low income households should receive remedial works free at the point of delivery but capped at a maximum of £10,000
- Those not classed as low income should be able to access an interest free loan repayable over a maximum time of 10 years
- The continuation of the current levy on energy bills and the consolidation of other revenue streams including carbon tax receipts to make the programme financially secure
- Some further incentive to be considered to ensure works are carried out. This could be levies on energy bills, council tax or house sale charges
- The consideration of planning for a second phase, following completion of the 15 year phase 1 programme. Phase 2 to work on EPC band B compliance

Such a programme would make significant inroads into many of the energy challenges the UK faces going into the future. Importantly, such a programme could also be

financed by using the existing resources already allocated for energy efficiency measures together with new resources provided by sources such as the taxes on carbon, levies already included in energy bills and money which is being used to encourage other forms of investment into the energy sector including de-carbonising electricity.

Clearly further work is required to turn this proposal into a full deliverable model but the evidence available thus far suggest that no other approach could deliver the range of positive developments over the time available and within the same cost parameters.

This report does not seek to go into huge detail as this detail can be found in the source material. Instead it looks at the key areas and provides the key points that make the argument so compelling and the solution so clear. It is an area that requires more focus and more serious attention such as is seen with other big infrastructure projects like High Speed Rail 2 and Hinckley Point C.

Why is it cold inside?

The energy efficiency of the UK's housing stock is a major problem due to the amount of energy that is wasted in simply trying to keep homes warm. It is an even bigger problem when households cannot afford to meet the costs of the energy required to do so. This wasted energy becomes much more of a key issue as we move away from our reliance on relatively price stable and secure indigenous supply.

How do we know the housing stock is a problem?

- The Buildings Performance Institute of Europe in its report in 2011¹ found that the UK has the oldest housing stock in the European Union, with over half built before 1960 and just over 10% built since 1991. Also, the older housing stock mean that UK homes require at least double the energy to stay warm compared with many countries, even those with colder climates such as Sweden.
- Using the Energy Performance Certificate (EPC) rating scale which classifies properties on a scale of A (most efficient) to G (least efficient) it has been calculated that there are 6.72 million homes in England alone who fall into the lowest three bands (E, F & G) and that represents one in three of all properties. Many of the occupants of this group were classed as being in fuel poverty².
- Again looking at the research carried out by Energy Bill Revolution and the Association for the Conservation of Energy (The Cold Man of Europe) we can see how poorly the UK performs in comparison to its European neighbours. The report demonstrated that 15.9%³ of the UK population live in what is classed as a leaky home. This means a dwelling with a leaking roof, damp walls/floors/foundation or with rot in the window frames or floor. Not only are these homes hard to keep warm they also present a clear health risk to occupants.
- We can again demonstrate how poor the existing UK housing stock in the UK really is by using the technical calculation of the U value of walls. U values measure how much heat is lost through a buildings fabric. In both the average measure and the discrepancy with the

optimal measure found in Sweden, the UK performs poorly in comparison to its peers in other European countries where comparable data is available.⁴

The table below demonstrates that only France has poorer U values than the UK. The lower the U value the better the buildings fabric and its retention of heat.

Table : Average U value of walls in single family dwellings Country	Average U value of walls (W/m2K)	Optimal U value	Discrepancy	Rank
Sweden	0.35	0.17	0.18	1
Denmark	0.57	0.19	0.38	2
Czech Republic	0.86	0.22	0.64	3
Austria	1.04	0.20	0.84	4
Netherland	1.10	0.21	0.89	5
Slovenia	1.21	0.27	0.94	6
UK	1.16	0.21	0.95	7
France	1.66	0.25	1.41	8

We believe it is helpful to look at the direct comparisons with Sweden. Not only is this country considered to have excellent practice when dealing with issues of home energy efficiency but in terms of the gross disposable income of households per capita, it is similar to that of the UK.

We must ask ourselves why it is that the UK, which has lower energy prices and higher mean temperatures than Sweden has;

- A level of excess winter deaths which is some 23% higher
- The number of people reporting that they are unable to afford to heat their home is four times greater
- The share of households who must spend a 'considerable share of expenditure on energy' is some 70% higher in the UK than Sweden.

We would suggest that there is an absolute and direct correlation with the fact that the share of people in the UK who live in leaky home is almost twice as high as in Sweden and the fact that UK homes lose three times more heat than in Sweden due to levels of poor insulation.⁵

We can therefore clearly establish that a large proportion of the UK housing stock is in serious need of improvement and that homes are lagging behind their equivalents in Europe when it comes to staying warm.

1 Buildings Performance institute Europe – Europe's buildings under the microscope 2011

2 EBR & ACE Burning Cash Day 14/02/14 p2 2.1

3 EBR/ACE Cold Man of Europe p7-3.2.2

4 EBR/ACE Cold Man of Europe p8 table6

5 EBR/ACE Energy efficiency and excess winter deaths; Comparing the UK and Sweden Nov 2013

Why does this matter?

It matters because domestic homes are major users of both gas and electricity and those with poor levels of energy efficiency are either having to waste a great deal of this gas and electricity, or they simply cannot afford to stay warm.

It matters because the wasted energy that could have been saved would not only reduce domestic energy bills for consumers, but also the overall demand for gas and electricity and at the same time, reduce our carbon emissions.

- In 2012 UK households accounted for 61% of UK gas consumption and around a third of electricity. The Government predicts that in total this will rise by a further 7% between 2015 and 2027.⁶
- UK householders spent £32 billion on domestic energy alone in 2012 and it is a figure that has doubled since 2003 when total spend was just under £15 billion.⁷
- Spending on gas has risen faster than spending on electricity despite it not being subject to green levies for renewable energy. The government has published projections that it uses for planning purposes, suggesting that gas prices will rise by a further 20% over the next five years. Other planning scenarios project higher increases to as much as 70%.⁸
- Over 90% of all UK domestic properties use gas for heating and hot water through central heating systems.⁹

One of the suggested reasons for the historic poor energy efficiency of UK homes is that energy prices in the UK have been lower than our peers in Europe and so as a nation we have become complacent in this area over a long period of time.

This is especially true in relation to gas which is the primary source for heating homes in the UK. The UK government calculates that average gas prices in the UK are the second lowest in the EU 15.¹⁰ We have become heavily reliant on indigenous supplied gas for heating and hot water and yet we are faced today with a future relying on more expensive and less secure supplies taking their place.

Alternative supplies of gas would come into the UK via pipelines or ships which carry liquefied natural gas (LNG).

These sources would be much more vulnerable to movement in world market prices and demand. An example of this can be seen following the decision of Japan in 2011 to switch off its nuclear power plants following the Fukushima accident. To replace this energy source Japan switched to LNG, sucking in nearly a third of global demand with the price nearly trebling as a result¹¹.

To what extent would insulating homes help reduce energy costs and consumption?

Research carried out for UNISON by Prashant Vaze shows that £6 billion, or £9 billion (if prices continue to rise on trend) of heat could be saved simply by installing low cost insulation measures in people's homes.¹² On its own this is a huge figure but analysis is also available on the saving for households.

In a report by The Association for the Conservation of Energy and Energy Bill Revolution (Burning Cash Day February 14th 2014) evidence was presented that suggested those living in a home with a low standard of fuel efficiency were wasting £650 every year¹³.

This meant they could in fact save 41% of their average gas costs each year by installing energy efficiency measures. This is the equivalent of a household which turns on the heating on the 1st October (known as central heating day) enjoying free heating and hot water from the following February right through until the following October.¹⁴

The report also explained that even with a home with an average level of energy efficiency (for example, already with loft and cavity wall insulation) the family could still save £313, or 25% of their gas bill through additional measures.

The report used the Standard Assessment Procedure (SAP) 2009, which is the same used by government use to calculate the savings on gas consumption for heating and hot water. In assuming a gas price of 4.21p per kWh and a yearly standing charge of £96, the savings from a range of measures were calculated as follows;

- Loft insulation: £192
- Cavity wall insulation: £148
- Factory-insulated hot water tank: £173

6 Prashant Vaze –research for UNISON and EBR 2014

7 ONS (2013) Consumer Trends Q2

8 Prashant Vaze – Re-build Britain, research for UNISON and EBR 2014

9 <http://news.bbc.co.uk/1/hi/8283796.stm>

10 DECC, Quarterly Energy Prices 2013 Page 55

11 Financialpost.com/2014/01/24/ Nick Cunningham OILPRICE.com

12 Prashant Vaze 2014 Re-build Britain

13 EBR & ACE Burning Cash Day 14/02/14

14 EBR & ACE Burning Cash Day 14/02/14

- Cylinder thermostat: £4
- Heating controls: £18
- New condensing boiler: £118

Other organisations have given estimates on savings achieved by carrying out simple energy efficiency measures. These all suggest similar levels of reductions in expenditure due to less energy consumption.

The Energy Saving Trust operates a website that allows people to assess their house individually and calculate the individual savings that could be achieved and these are broadly in line with those listed here.

How would this help reduce reliance on gas imports?

In 2004 the UK ceased to be self-sufficient in gas. In 2012 net imports of gas accounted for just over 40% of gas use and this is rising to a point where as soon as 2020 we might be reliant on gas imports for as much as 70% of demand¹⁵. These gas imports are much more susceptible to price fluctuation and can present additional risks to guaranteed supply. Investing in energy efficiency would reduce our dependence on imported gas.

In new research by Prashant Vaze commissioned by UNISON and Energy Bill Revolution, it was shown that a national and universal energy efficiency programme could save as much as;

- 19% of the gas we now import by 2027

We estimate that if 19% of gas use was saved by implementing a universal energy efficiency programme then this alone would save the UK £2 billion in gas imports every single year.

How significant is this reduction?

To fully understand the significance of the figure it is worth considering the current ongoing debate about fracking and shale gas. This is a resource the government is currently supporting in an attempt to develop more indigenous supply of gas.

The development of shale is controversial because of

worries about environmental pollution from the chemicals used to fracture the rock, the accidental releases of methane and the size and number of wells required to produce the gas.

Estimates have been made of the UK shale gas resource. One survey for the government by the British Geological Survey¹⁶ estimated that the largest reserve in the Bowland might have 0.5 billion GWh of shale gas in place.

The US Energy Information Administration estimates that the UK's extractable resource is around 1% of the British Geological Survey's 'in place' estimate. Shale gas extraction requires more land and capital investment than conventional wells since the gas has to flow through narrow fissures in fractures created in the rock. Between one and six wells are sited per square kilometre, over a substantial territory.

Again looking at new research by Prashant Vaze for UNISON; a national and universal domestic energy efficiency programme would displace the need for a huge expansion of fracking to secure shale gas. The gas use avoided through such a programme would by 2027 displace the need to develop up to 470 wells respectively if they are the same size as typical US wells.

The second biggest demand for gas after the heating of homes is in the generation of electricity. Gas has become the largest source of fuel for the UK's power sector in four of the last five years. The UK now has 11 large gas fired power stations, each capable of generating more than 1 GW of electricity. There are a large number of smaller plants too. A national and universal domestic energy efficiency programme would save enough gas equivalent to displacing one of these 1 GW power stations.

A systematic national programme of delivered energy efficiency improvements could make significant inroads into the demands for imported gas from overseas.

15 <http://www.telegraph.co.uk/finance/newsbysector/energy/10678417/UK-energy-security-at-risk-as-gas-imports-surge-Centrica.html>

16 DECC & British Geological Survey: The Carboniferous Bowland Shale gas study

What about fuel poverty?

Fuel poverty is a growing scandal in the UK as more households struggle to meet rising bills simply to keep warm. The Office for National Statistics in its November report on Excess Winter Mortality in England and Wales 2012/13¹⁷ calculated that over 31,000 excess deaths occurred during that winter, an increase of some 29% from the previous winter of 2011/12. While not all excess winter deaths can be blamed on cold homes, it is widely recognised that they are a contributory factor.

In 2013 Energy Bill Revolution produced a report compiled by the Association for the Conservation of Energy. The report detailed the following¹⁸;

- Fuel poverty was and is a major social crisis in the UK. There are over 5 million households in fuel poverty needing to spend more than 10% of their income on energy in order to keep warm. This number will increase significantly if gas prices rise as the Government expects
- Only Belgium had a higher proportion of households surveyed by Eurostat (European Commission statistics authority) who reported not being able to afford adequate heating and only those living in Denmark and the Czech Republic spent proportionately more of their household income on energy than UK households do
- While it might be assumed that the householders were not keeping warm due to the price of energy, this was not the full picture by any means. In fact, despite recent price increases the UK has largely maintained relatively low energy prices compared to other European countries. The UK Government reported that in 2011 UK domestic electricity prices including taxes not refunded were the third lowest in the EU15 and for the supply of gas it was the second lowest in the EU15. Eurostat also confirm these relative positions

In a recent report by the Children's Society it was estimated that 3.6 million children thought their home was too cold last winter. Around 1.3 million said it had damp or mould. They also discovered that last winter two thirds of families thought they would have to turn their heating down because of cost. Of these families 55% were worried about their children becoming ill as a result of their home being too cold¹⁹.

Keeping warm is a basic need. Although poorer households spend less in absolute terms than richer

households, they spend significantly more as a proportion of their spending. In 2012 the 10% of lowest earning households spent £13.30 a week on heat and power representing 8% of total income. The richest 40% of householders spent 4% or less of their income on energy. In effect the poorest spend double the proportion of income on energy than the richest.

A systematic national programme of delivered energy efficiency improvements could all but eradicate the scandal of fuel poverty. Such a programme would need to deliver improvements to low income households free of charge but the benefit would be immediate.

What about the wider economic benefits of a universal programme of domestic energy efficiency measures?

The rolling out of a major new energy efficiency programme could have a significant positive macro-economic impact on the UK economy as a whole. This arises through the stimulating effect the spending on energy efficiency has on the wider economy combined with the positive knock on impact on individuals. The impact would also be fairly immediate, with economic growth stimulated in areas that have struggled most during the recent recession and generally lag behind economically.

Evidence from Germany and the Czech Republic demonstrated the positive macroeconomic return generated and showed that such energy efficiency programmes had a number of positive spin offs including increased tax revenues. In further analysis carried out into the German 'KfW' programme in 2011 it was stated that;

"These programmes (energy efficiency) can relieve the national fiscal burden if they generate increases in government revenues or reductions in government expenditure which exceed the costs of the programme. The increase in revenues and reductions in expenditure for the government arise out of additional revenue from taxes on sales, taxation of wages and salaries, taxation of company profits, and contributions to the social security system (German model). The savings in government expenditure stem from the reduction in government support payments whenever the programmes lead unemployed people to find employment which is subject to the compulsory payment of social security contributions.Taken together (the programmes) are yielding positive effects most notably on the budgets of

17 ONS Excess Winter Mortality in England and Wales 2012/13 provisional.

18 EBR/ACE Cold Man of Europe p2

19 Children's Society; Behind Closed doors by Dr Sam Royston

*social insurance institutions, but also on the budgets of the federal government states and municipalities*²⁰.

The net impact in Germany was that the public purse ended up being a net beneficiary from a fairly substantial energy efficiency programme that had required significant public funding. In fact 3 times more public revenue was generated than the subsidised loan programme cost. This is particularly relevant when we consider how such programmes should be financially supported in the UK.

In the report 'Jobs, Growth and Warmer Home', Consumer Focus commissioned Cambridge Econometrics and Verco²¹ to model the macro-economic benefits boost from using the proceeds of carbon tax receipts to support energy efficiency programmes. They compared these benefits with alternate mechanisms of government intervention to boost the economy such as cutting VAT, reducing fuel duties and building roads. The results were striking and showed that investment in energy efficiency measures was the most effective method of direct government intervention. The Cambridge Econometrics analysis uses the Office of Budget Responsibility's long term forecast to calibrate its baseline about how the economy will develop over time and so is forward looking in the potential gains that can be accrued.

If we looked only at the effects derived from a national programme across the UK, which simply sought to address the homes currently in or at risk of fuel poverty (some 9.1 million homes) the research suggested that;

- 129,400 jobs would be created by 2027
- The nation's overall GDP would increase by 0.38%
- The benefits would be visible both in the short and long term
- Disposable income would increase as a result of lower household energy expenditure
- Better balance of trade figures would result as less gas is imported from overseas.

The detailed modelling by Cambridge Econometrics identifies an important and unexpected economic benefit from investing in improving the energy efficiency of UK households. Not only does it making better use of

depleting fossil fuel resources; not only does it boost available spending power of poorer households (who gain the most welfare from extra consumption) it also has better macro-economic outcomes than the other policies to stimulate the economy that were tested by the researchers.

Energy efficiency spending also has a direct impact on GDP growth through increasing the 'investment' component of GDP, and an indirect impact through improving the UK's balance of trade on importing natural gas.

The international Energy Agency stated that;

*'The failure to properly evaluate the benefits of energy efficiency likely results in underinvestment in energy efficiency. The foregone benefits represent the 'opportunity cost' of failing to adequately evaluate and prioritise energy efficiency investments. The opportunity costs may be very large, and in particular in a context of increasing global demand, stress on resources and climate concerns, they represent a cost that we cannot afford to bear. With estimates of GDP growth resulting from energy efficiency converging on around 1%, energy efficiency should be considered as part of mainstream economic policy rather than an energy issue only'*²²

So we believe that the evidence available is clear – a national programme of energy efficiency improvements would have considerable economic benefits aside from the core issues of affordable heat and energy conservation.

20 STE Research Report 2011 – Impact on public budgets of the KfW promotional programmes.

21 Cambridge Econometrics and Verco 2012: Jobs Growth and Warmer Homes.

22 International Energy Agency, Spreading The Net Lisa Ryan and Nina Campbell p7

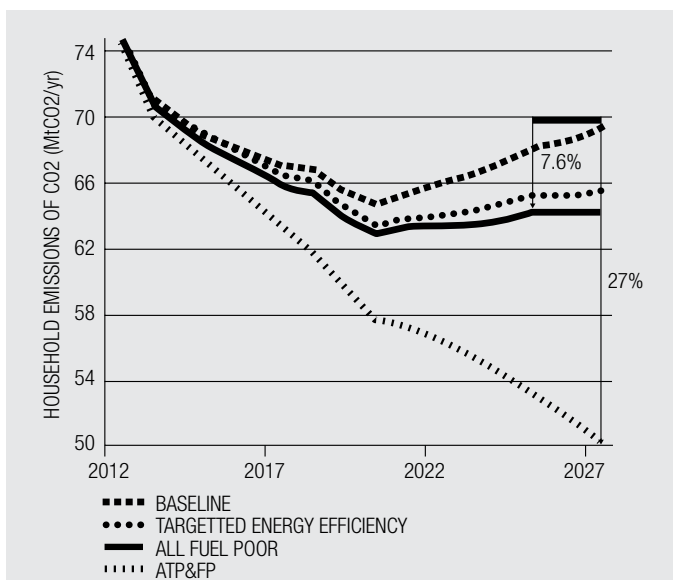
What environmental gains would be achieved?

In 2008 the UK set itself a legally binding target of reducing its carbon emissions by a figure of 34% by 2020, relative to 1990 emission levels. These targets would increase, leading to further cuts of 60% by 2030 and 80% by 2050.

Currently the UK emits 575 million tonnes of carbon dioxide a year of which around a quarter is attributable to the power sector. Household use of heating fuels accounted for around 15% of UK's CO₂ emissions in 2012. This share is forecast to rise to 20% in 2027 as electricity becomes decarbonised.

The table below shows the projected fall in household carbon emissions between now and 2020 as a result of just existing policies like the Energy Company Obligation and tougher building standards. But, without further programmes to improve energy efficiency, household emissions are expected to start rising again.

The modelling by Cambridge Econometrics suggests that by 2027, addressing just the 'All fuel poor' households could reduce home heating emissions by more than 7.6% compared to the baseline and the universal approach derived from combining the 'All fuel poor' and those 'Able to pay' groupings could reduce emissions by 27%. In the 'All fuel poor' case the researchers allow households to take 40% of the improvement in their homes' energy efficiency as comfort. In the other scenario the author of this report assumed 'Able to pay' would not heat their homes to a higher temperature.



This 27% reduction in carbon emissions is actually essential if we are to get even close to achieving the required reductions. It is also eminently achievable. A universal domestic energy efficiency programme uses proven technology and could be rolled out as resources allow. This is as opposed to some other carbon reductions schemes which are yet to be operational or require technology that is still unproven.

How could such a scheme be delivered?

While policy makers in the UK have long recognised the merits of energy efficiency programmes the various approaches tried have not adequately addressed the magnitude of the problems at hand. Indeed, attempts to devise schemes to help the most vulnerable have clearly not worked and have wasted valuable resources simply in trying to identify eligible recipients.

Currently, the government relies on the Energy Company Obligation (ECO) and the Green Deal as its policy tools to improve energy efficiency. Neither approach has been considered hugely successful despite a pot of £1 billion being made available.

In its report Heat 2 Homes the Institute of Public Policy Research (IPPR) suggested; that the ECO scheme was 'highly inefficient and bad for competition' It also stated that ECO had proven very poor at targeting fuel poverty because 'determining whether a household is fuel-poor requires information about their income and energy costs, which can only be measured accurately through an in-house assessment' and as a result '80 per cent of the funds spent every year (£433 million of £540 million) go to households that are not fuel poor'²³.

The Green Deal has been even more ineffectual as a policy tool with again the IPPR stating that;

'the Green Deal is dramatically under-performing. The government projected that 130,000 households would take out a Green Deal loan in 2013, but only 813 had done so or committed to doing so by the end of October of that year. At current rates, the government will not achieve even 1% of its projection'.²⁴

On the other hand, evidence actually suggests that adopting a door to door approach is the most effective way of ensuring that universal coverage is provided in a systematic way to achieve the maximum positive impact. Such an approach

23 Institute for Public policy Research (IPPR) Help To Heat – Nov 2013 P3
 24 Institute for Public policy Research (IPPR) Help To Heat – Nov 2013 P17

also involving local authorities, energy companies and small/medium size energy efficiency businesses working together is more likely to succeed as the IPPR points out; 'Engaging concentrated groups of households within geographical areas is a proven way to drive demand for energy efficiency improvements. This is because it can produce social norms around the installation of efficiency measures, and reduce the costs of installations. It is also important to have trusted organisations provide information'²⁵

In 2012 The Department of Energy & Climate Change (DECC) acknowledged that;

'It is widely recognised that delivering energy efficiency projects street by street across whole communities has many benefits including economies of scale, increased demand driven by seeing the work being carried out and what can be achieved on neighbouring properties'

The creation of a national minimum standard and a universal approach makes sense and would ensure that the maximum national gain was achieved. Clearly it would make sense to start any programme in areas already identified as being in greatest need and to seek early intervention with vulnerable households but it would not end there. We believe that the starting point of any universal programme would be to ensure that all domestic UK properties receive a free (possibly mandatory) assessment of their homes energy efficiency and classification on the EPC scale.

How much do we estimate a Universal programme costing?

Various estimations have been arrived at as to the full costs of a universal scheme, ensuring all UK homes meet reasonable energy efficiency standards. We have looked at the latest and very comprehensive research which has been recently carried out by Verco for Consumer Futures. This information is based on the 2011 English Housing Survey and so only covers housing in England. They define (and we support) reasonable as meaning EPC Band C, the point at which fuel bills can be considered affordable as opposed to the current average energy efficiency rating of EPC Band D²⁶. New build homes are currently required to meet EPC Band B standard.

Clearly any measures to achieve the benchmark rating of Band C will take time and some years to achieve which is one important reason that further delay should be avoided. In considering the costs required to achieve the desired

outcome it was felt that introducing a cap of £10,000 per house would ensure available money was used as effectively as possible with the maximum cost benefit applied.

To improve the homes of low income householders to reach the benchmark of Band C (with £10k max cap) requires an estimated average investment of £4,256 per property. To carry out the same works in homes with middle to higher income category requires an estimated average cost of £5,523 per dwelling²⁷.

In England alone, low income householders account for 4.1 million properties and it is calculated that £19.4 billion²⁸ is needed if works are carried out without cost to this group. The majority of homes however fall in the middle to higher income category (72%) and of this group 2.2 million already meet or exceed the benchmark Band C rating. This leaves an estimated 14 million homes.

To carry out this level of investment on the 14 million homes of middle to high income householders in England without any contribution may not be feasible owing to the total cost required. By providing the homeowner with a guaranteed interest free loan to repay the cost of any works over 20 years the total bill would be £55 billion, however making the loan repayable over 10 years reduces the total cost down to £27 billion. The cost to the householder of repaying the capital element of the loan is partially offset by the average bill savings that would take place after installation of measures. This has been calculated by Verco at an average bill saving of £337.

The research by Verco did not include Scotland, Wales or Northern Ireland. In Scotland the housing composition is different with many more flats/tenements in the housing mix. Still the average cost of £4,256 per property would be valid as would the average cost of £5,523 for homes whose occupants are middle to higher income. There are 4.4 million households in Scotland, Wales and Northern Ireland and if the split between low incomes and middle to higher income is in line with England an extra £22.5 billion is required.

In essence using the conclusions reached by Verco and other studies, we arrive at a total cost in the region of £68.5 billion for the UK or £4.5 billion per annum over a fifteen year period.

25 Institute for Public policy Research (IPPR) Help To Heat – Nov 2013 P5
26 Help to Heat Mark 2 – Page 14 2.6 table 2

27 Help to Heat Mark 2
28 Help To Heat Mark 2

How could we finance such a programme?

Working on the assumption that to deliver the universal programme would cost in the region of £68.5 billion or £4.5 billion over 15 years we can begin to look at ways of funding this investment.

Monies are already allocated in the system to fund energy efficiency, they are largely targeted at low income householders. This money is raised via levies on current energy bills and funds the ECO (Energy Company obligation) scheme. Prior to the ECO scheme, we had the CERT (Carbon Emissions Reduction Target) scheme while the Chancellor recently announced that some of this would be funded in the future via the state. Either way around a £1.3 billion pounds per annum of investment is available at current levels.

If we look at the amounts of revenue the government will receive via carbon tax receipts we can see that large sums of additional revenues will be provided to the state via the EU Emissions Trading System (ETS) auctions and the carbon floor price. In fact, between now and 2027 around £43 billion will be raised at an average of £3.6 billion per annum, this sum was recently reduced from £60 billion by freezing the carbon floor price. At a later point it could be unfrozen again to increase these revenues.

In the UK, the government will simply use this revenue to fund general expenditure whilst in France for comparison; a political decision was made to retrofit its housing stock to make it more energy efficient. Considering the positive economic benefits of installing energy efficiency measures as described already in this report, using the revenues from carbon taxes makes sense. Using proceeds from carbon taxes also establishes a clear link between green taxes being used to fund green measures and helps rationalise the additional household burden these taxes create. The European Union are also clear that proceeds from Emissions Trading Scheme (ETS) auctions should be used to support carbon emission reductions²⁹.

How carbon taxes are used is a political decision, as is the level they are set at. So is introducing other forms of taxation or direct levies to support a national programme. A range of options exist if the political will and commitment is present. Recipients of such measures do of course gain financially through savings on domestic bills.

We should of course look at the support currently being offered to other forms of new generating capacity which the UK needs to meet future demands. Without getting into

any argument about new nuclear generation, the financial package that underpins it is very large. Dr Paul Dorfman of the Energy Institute, estimates that in respect of Hinckley Point C, the construction costs are likely to exceed £16 billion with an annual subsidy approaching £1 billion per annum being required³⁰. For the current supply of renewable energy it is currently estimated that an annual subsidy of around £3 billion per annum is needed to ensure it is economically viable.³¹

As this is a national programme of energy efficiency measures it should be treated as a national infrastructure project and given the same financial profile as projects such as High Speed Rail 2 (HS2) receive.

We have already touched on (in a previous chapter) the macro economic benefits of energy efficiency schemes and considered the impact of a national programme in Germany. The lessons learnt from Germany are substantial namely that such an investment programmes can actually provide a net return to public finances through increase economic activity and revenue. Rather than a £68.5 billion cost to the exchequer the programme of works could be cost neutral or generate surpluses.

So although a universal programme of domestic energy efficiency measures would require a significant budget for planning purposes, this figure, when set against costs of new generating capacity, the sources of revenue already available and the potential for fiscal gains, is eminently affordable. All it takes is the right political will.

30 <http://www.bbc.co.uk/news/business-24604218>

31 <http://www.scientific-alliance.org/scientific-alliance-newsletter/nuclear-rebirth>

29 http://ec.europa.eu/clima/policies/2030/index_en.htm

Conclusion

The multiple energy challenges we face as a nation are not imaginary and they are not going away any time soon. This report has sought to highlight these challenges

Governments in the UK have long known about the need to improve the domestic energy efficiency of the UK's housing stock and various attempts to address this problem have been tried. Each attempt has however, only ever been partially successful and has sought to target available resources on the most vulnerable. This targeting itself, has only ever had mixed results and the scandal of fuel poverty grows yearly.

This report however does not simply focus on needing to address fuel poverty. It has demonstrated that multiple gains are achieved, if a systematic and planned programme was launched to ensure every home achieved a minimum domestic energy efficiency rating, which would be set to meet the requirements of an Energy Performance Certificate at Band C.

These gains are striking and confirm the view of the International Energy Agency, that the full range of benefits have never been fully evaluated or factored in by policy makers when making policy decisions. This failure represents an opportunity cost which is truly significant.

To recap on the full range of benefits a universal programme might achieve;

- Significant reduction in the demand for gas which is used to heat homes, in the region of £6 billion per annum rising to £9 billion
- Consequential reduction in reliance on imported gas and the requirement to develop large scale fracking operations
- Near eradication of fuel poverty within the UK
- Massive job creation programme with over 130,000 jobs created right across The UK
- Increases in both householder's disposable income and the nations GDP spread evenly across all regions
- Significant inroads into meeting agreed cuts to carbon emissions

- Sustainable, delivering long term gains over a number of years

Although on the face of it the costs of delivering such a universal programme appear massive, these costs need to be measured against other comparable interventions, like the Hinkley Point C nuclear development programme and outside of the energy world, the building of High Speed Rail 2, at anything between £40 and £80 billion pounds. They should also be measured against the overall revenue gains that are predicted through increased economic activity which could make the whole programme cost neutral or positive.

Finally any costs need to be offset against the generation of some £43 billion in Carbon tax receipts, which we would argue should be used to help support initiatives that have a clear environmental and carbon reducing impact.

To conclude we would suggest that the evidence is compelling in support of a national programme of energy efficiency measures. At the very least the government should acknowledge the wide body of evidence in support of such measures and order a systematic evaluation of the merits of such a programme and action any proposals.

UNISON Commentary

Over the last few years the debate around the country's energy challenges has intensified. This debate has largely focused on the affordability of energy in the presence of rising utility bills but, alongside that issue the noise has also risen concerning future energy supply needs, addressing climate change and the need for a balanced economic recovery.

The debate about energy affordability has been particularly heated with significant political intervention over recent price rises and fuel poverty. The net result is that suggested short term measures and initiatives, have taken the place of long term strategic thinking and planning, for what is in the nation's best interests beyond the next election.

In the current policy vacuum that now appears to exist, UNISON has sought to inject some rational debate, and it is for that reason we have looked at what we consider the most effective and practical way forward to meet the many challenges we face. We believe the challenges to be great and for this reason we have looked at a bold solution, one that will actually deliver sustained improvements over a number of years.

UNISON is in a unique place to comment; being both a union with 1.3 million members many of whom are low paid and at the same time being one of the largest trade unions in the energy industry representing members across the spectrum of activity. This report draws on a range of credible sources and we have worked with Energy Bill Revolution to commission some new research carried out by Prashant Vaze. The work by the Association for the Conservation of Energy, Verco, Cambridge Econometrics and the Institute for Public Policy Research has been essential in coming to our conclusions on the way forward.

The report confirms that as it stands we are now fast depleting the indigenous supplies of gas that have provided such a relatively cheap source of energy. With the development of gas fired central heating, the UK is now heavily dependent on this gas to heat our homes, cook food and provide us with hot water on tap. Non indigenous supplies are likely to be more costly and less secure resulting in yet further continued price rises. The government themselves are planning on a further 20% increase over the next 5 years with some planning assumptions even higher.

These rises will exacerbate the already serious concerns about fuel poverty but also act as a drag on economic growth. Various politicians have suggested it is the energy market which is largely responsible for the

increases and as such, the solution to increasing prices lies in further market reform. While not wanting to discount market related problems, this on its own will not address the key fundamentals, which this report suggests really needs addressing.

The sobering reality for householders, is that the UK is one of the worst equipped places to live in the developed world with which to absorb increased energy prices. This is clearly down to the poor state of the UK housing stock from an energy efficiency perspective. It is a pretty damning statistic that UK homes lose three times more heat than those in Sweden, due to poor household insulation and that the number of people who reported being unable to afford to heat their homes was four times greater, despite Sweden being a colder environment with more costly sourced energy.

Government attempts to address the poor energy efficiency of UK homes, have largely missed the goal on repeated occasions, largely through lack of ambition but also the failure to join up the many combined benefits a national programme would create and develop the case for a national and universal programme.

Programmes like CERT and ECO have improved some elements of the UK housing stock and programmes like Decent Homes; have ensured that the social housing stock is in a better place. In reality, these programmes have only touched the top of the iceberg and the bureaucracy required of these particular schemes has seen resources wasted. The most recent example of bad public policy in this regard, can be seen with the abject failure of the government's flagship policy the Green Deal, which everyone bar the government themselves acknowledge has not delivered.

Other energy challenges are similarly not being addressed in a manner that acknowledges the urgency of response required. Recent events in the Ukraine demonstrate the geo-political nature of energy supply and the importance of energy security. The last winter in the UK has again raised the profile of the negative consequences of climate change. We continue to see debates around the viability and desirability of large scale fracking and issues around over the state of investment in new generating capacity.

Considering the report's findings, UNISON is convinced in the merits of a national programme to deliver home energy efficiency improvements organised via a door to door methodical way. Such a programme really would make a difference to the challenges we face. All it requires is a political willingness to face up to the evidence and recognise the scale of change required.

So UNISON is calling on the government to take the following action without further delay;

- Ensure every UK home is classified according to its Energy Performance Certificate via a national free door to door assessment programme, which identifies the remedial works required to meet the EPC band C standard. Such a programme should be coordinated via principle local authorities who already hold significant information on both public and private sector housing conditions and also can help identify those who would be classed as low income.
- Instigate remedial works targeting known low income household areas first. The timetable for completion of works for this low income group should be within a 10 year timeframe, expanding to 15 years for the middle to higher income groups.
- Ensure that a national publicity campaign is launched explaining the national benefits of the programme and the details of how to access the remedial works. Effective communication is vital to ensure widespread take up
- Low income households should receive remedial works free at the point of delivery but capped at a maximum of £10,000
- Those not classed as low income should be able to access an interest free loan capped at £10,000 but repayable over a maximum time of 10 years. The average net cost of works should be offset by the energy savings essentially meaning this should be largely cost neutral to most households if average spends are required
- The continuation of the current levy on energy bills and the consolidation of other revenue streams including carbon tax receipts to make the programme financially secure. The involvement of the major energy companies should be encouraged to ensure success of programme
- Some further incentive to be considered to ensure works are carried out. This could be levies on energy bills, or council tax etc. It is important that saturation is achieved and as such we believe some form of carrot and stick approach may be required. Ultimately we would like to see the point after 15 years of all nearly homes meeting the EPC band C categorisation
- The progress on all aspects of this programme to be monitored and reported back on an annual basis

- The consideration of planning for a second phase, following completion of the 15 year phase 1 programme. Phase 2 to work on EPC band B compliance

UNISON will argue that it is the above measures that should be the energy priority of the present and future governments. The evidence suggests it is a more rounded and robust approach spreading the many benefits from the required investment far more widely and across a broader landscape.

Without action and regardless of potential market reforms that have been much debated, energy prices are likely to rise and rise in a more unpredictable way. The scandal of fuel poverty will also remain unabated and climate change targets will be missed. Finally the true economic benefits of this investment will never be realised.

In this report, UNISON has suggested a pathway forward into the future which literally ticks the right boxes in every way and should be adopted with haste. Continuing prevarication and delay is simply not acceptable and without strong government action and leadership the problems identified will get worse.

Now is the time for strong and decisive action ensuring we can all keep our homes warm in the future.

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