100% Renewable UK

‘How to organise a real energy efficency programme’
written by Dr David Toke

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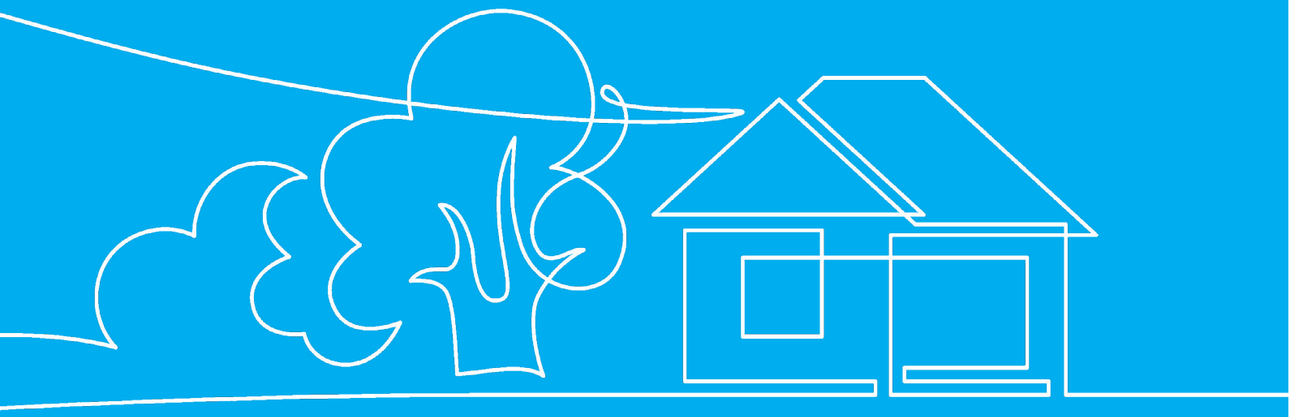

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How to organise a real energy efficency programme[1]

Executive Summary

This report makes recommendations about what needs to be done to implement an effective energy efficiency programme. In order to do this, this report examines both the problems of attempts to organise energy efficiency programmes in the last ten years, and also the elements that contributed to successful energy efficiency programmes organised in the previous ten years. In addition the report also examines ideas for pushing heat pump installation along more effectively than it is at present.

There is a vital need to reverse the lack of an effective energy efficiency strategy in the last decade. The gains are very large if a Programme can be implemented that is at least of the size organised in the period 2008-2012, preferably much larger. This Programme, insofar as its key measures are implemented in a typical uninsulated house, will now be giving great benefits on an annual benefit to the householder. These will be just under £600 a year at the gas prices set by the Government for October 2022, although in reality the savings will be much larger since all consumers will have to pay back money borrowed to stave off even higher energy bills.

Taking this into account these earlier investments in energy efficiency have a payback period of around 4 years at October 2022 gas prices. In addition, energy efficiency is a far better investment compared to Sizewell C given that by 2030, even with lower gas prices, British energy consumers will be earning well over £1 billion per year from such a Programme. By comparison they would earn nothing from Sizewell C until well after 2030.

However there are still political barriers to achieving success like this. We shall only repeat some of the mistakes of the last decade if the Government follows its earlier practice of relying on consultants to design unworkable schemes. In order to avoid the failures of the energy efficiency programmes of the last ten years and implement a subtantial energy efficiency programme we need to ensure a) a well-organised build-up of industrial and trades expertise, b) consistent efforts to consult the industry and trades about the best practical means of achieving energy effieincy objectives and c) well organised and authoritative Governmental structures.

Key Recommendations

- Appoint a Minister of State in charge of Energy Efficiency
- Set up a civil service Energy Efficiency Directorate headed by a Director General, a Senior Civil Servant grade 3 level (SCS3)
- Preferably re-establish a separate Department of Energy and Climate Change to house and coordinate these measures and institutions
- Re-nationalise the Energy Saving Trust and give it extra funds to enable it to be an effective advisor to the Government and aid its efforts to co-ordinate the energy efficiency industries and trades
- Set targets for energy efficiency targets for homes based on those proposed by the Committee on Climate Change (see Figure 3) – these proposals include around 8 million loft insulations, around 2.8 million cavity wall insulations and around 2.5 million external wall insulations. In addition other measures such as installing better heating controls and LED lighting should be incentivised
- The Programme should be focussed, as with the 2008-2012 CERT Programme, on reducing carbon emissions which means a main focus on reducing emissions from the gas heating sector. This should be delivered through an Energy Company Obligation on energy suppliers
- Build up industrial and trades capacity by bringing together representatives of all of the relevant industries and companies concerned with delivering the energy efficiency objectives and produce a plan to implement programmes based on agreement with these interest groups
- Establish effective training programmes to train necessary industrial and administrative personnel
- Build up energy efficiency targets and delivery involving escalating the size and coverage to all households of the Energy Company Obligations on energy suppliers over time so that there is sufficient expertise and industrial capacity to deliver the targets
- Establish an Energy Company Heat Pump Obligation on the energy suppliers to deliver an increasing number of heat pump retrofits to existing properties
- Introduce legislation to effect the ban on replacement fossil fuel boilers from 2024 as in Scotland. Simultaneously fabric efficiency rules should be tightened and solar pv and batteries made mandatory on new build
- Establish a programme to transition all district heating systems to be supplied by large scale heat pumps.

Main Report

How to organise a real energy efficiency programme

Energy efficiency - from success to failure!

It is one of those marvels of our time that the UK still does not have a functional energy efficiency strategy. This is despite the fact that the UK faces the twin challenges of needing to reduce reliance on expensive natural gas and the need to rapidly reduce carbon emissions that burning natural gas generates. Yet, given the experience of ineffective or failing energy efficiency programme that have been organised over the past ten years one would almost be forgiven for thinking that it was impossible to organise an effective, large, energy efficiency programme. But urgent action is needed both to make existing homes more energy efficient whilst ensuring that new homes are powered by heat pumps, have much improved fabric efficiency and have solar pv as a mandatory element in new build. New and, as far as possible, existing homes, should be fitted with home-based battery systems.

The emphasis in this report is on action to improve energy efficiency of existing homes.

Yet, as is discussed in this report, in the past, from the late 1990s to 2012 the size of energy efficiency programmes was both larger and highly cost efficient. This reports seeks to discover how an effective energy efficiency programme can be started in the near future. In doing this the report will a) explain how effective energy efficiency programmes have been deployed in the past b) to explain how there has been such a failure of energy efficiency policies since then, and c) to lay out what we need to to develop an effective energy efficiency strategy going forward.

What is energy efficiency?

Energy efficiency can mean many things, but here I restrict my analysis to technologies applied to buildings that can be influenced by regulations, incentives and taxes. This in turn can be divided into retrofits on existing buildings and new buildings. Dealing with retrofit measures, as implied by these two Figures, the biggest ones are loft insulation and cavity wall insulation (CWI). Other measures include improving heating controls, solid wall insulation, double and (now preferably) triple glazing windows, fitting LED lights and, of increasing importance, heat pumps. As can be seen from the Figure 1, the leading measure in terms of numbers has been loft insulation, followed by CWI, and this will in their projections carry on into the future, with solid wall insulation increasing in importance.

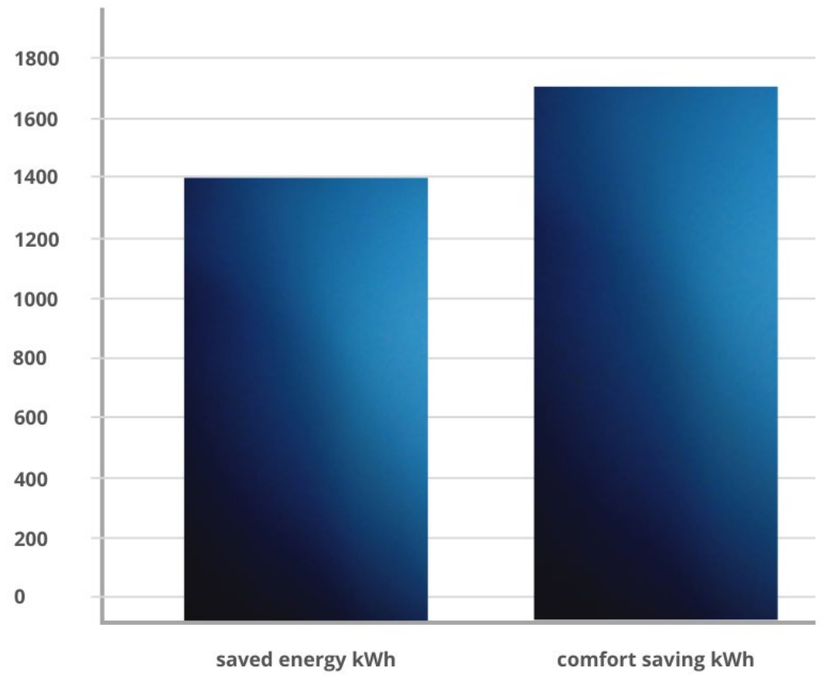
A crucial difference between the energy efficiency programmes put in progress to end by 2012 and the residual schemes being delivered now is that the earlier schemes were aimed at reducing carbon emissions as well as tackling fuel poverty. The currently operating schemes are focused solely on fuel poverty and thus appear to be on average quite expensive since the incentives needed to encourage energy efficiency in better off households are much lower.

Savings from energy efficiency measures will partly be represented as actual energy savings. Roughly half of these savings, however, will 'rebound' in the sense that the measured energy reduction may be roughly only half the theoretical reduction in consumption. But such 'comfort' savings will still add value to the consumer because they will allow the consumer to budget to obtain greater value.

In order to illustrate the different dimensions of savings from energy efficiency measures cavity wall installations are selected as an example. The consumer benefits from energy efficiency comprise two elements which are added together: a) actual reductions in energy use and direct savings and the bills they pay for energy and b) other benefits, especially the ability to enjoy greater warmth that they can afford.

We can see this in Figure 1 below which draws on a study of measured actual energy savings from cavity wall installations.[2] The study found that actual energy savings, at an average of around 1400 kWh per installation, were less than anticipated in theory. It is assumed here, on the basis of studies on the 'rebound' effect, that around 55 per cent of theoretical energy savings are taken as (rebounded) comfort[3]. These estimates of the rebound effect may be on the conservative side, so the savings quoted in the Figures below are likely to be larger in reality.

Figure 1 - kWh savings from typical cavity wall insulation

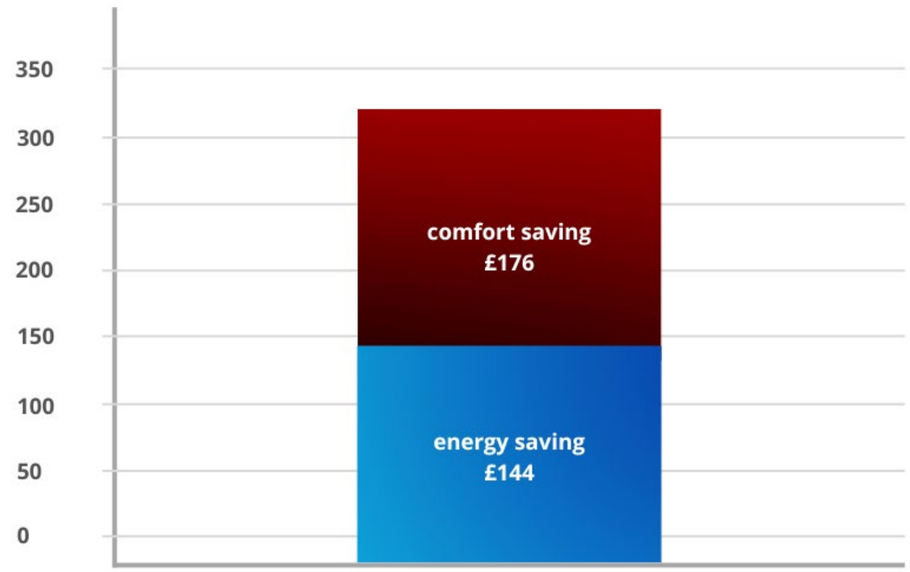


As energy prices have risen, so have the gains from installation of energy efficiency measures, both in terms of reduced energy savings and consumer comfort. Estimations for consumer value for cavity wall insulation are given in Figure 2. Costs of installing cavity walls are taken from a estimations for a typical 3 bed semi-detached house[4].

As can be seen the gains in consumer value are broken down into actual realised energy savings and additional comfort savings. These are calculated at estimated natural gas prices for the fourth quarter 2022, which, after the Government's action to reduce the impact of energy price rises, may be around 10.3p/kWh for natural gas. It should be noted that energy prices are projected by Cornwall Insight to jump by over 30 per cent beyond October 2022 levels in 2023[5]. Most heating is done through natural gas, so this price is used as the basis for calculation. As can be seen from Figure 2 the total economic benefit for an existing cavity wall installation for the average consumer is calculated to be £320 for a year at 10.3p/kWh for natural gas[6].

This benefit is taken directly in having to pay for a smaller amount of energy, but also in having a more comfortable heating regime and releasing the consumer's money to spend on other much-needed purposes.

Figure 2 - £ Savings direct to a household consumer from typical cavity wall installation in 2022-23



However, it should be noted that this calculation, as set out in Figure 2, will greatly understate consumer benefits. This is because consumers will have to pay back the money that has been borrowed from banks under a Government guarantee. This will raise energy prices by a considerable degree in the coming years, thus increasing the value of energy efficiency savings.

When energy efficiency worked

The 1990s and early 2000s saw the development of the notion of the 'energy company obligation' (ECO). This involves the energy suppliers being expected to organise a volume of energy efficiency measures determined by Government. Indeed the UK was regarded as an early proponent of this approach[7]. The costs of this programme were charged to energy consumers bills, mainly electricity, and formed part of what is now known as the 'green levies'.

A key part of the developing energy efficiency obligation arrangements was getting the relevant industries and trades together to hammer out an effective programme. This gathered pace in the early years of this century. Training was a key part of this. Andrew Warren, the Chair of the British Energy Efficiency Programme said that: "Larry Whitty was the most effective Minister I came across. For example. he organised the heating engineers to be paid to be trained to fit more efficient condensing boilers. That sort of interventionist training support is needed today with heat pumps."

These programmes built up in size until the biggest programme, the Carbon Energy Reduction Target (CERT), was launched in 2008.

The CERT Programme involved an array of measures delivered by energy suppliers. They had to meet a target, expressed in reductions of carbon dioxide emissions. Different measures were accorded different amounts of C02 reduction as agreed by discussions between agencies prior to the scheme's launch. The biggest portion of the target, around two-thirds, was achieved through loft insulation and cavity wall insulation. The rest involved various other measures including heating controls, boiler upgrades and lighting measures. The scheme ran from 2008 to 2012. In total it was expected that around 500 TWh of energy, mostly in terms of natural gas, would be saved over a 40 year period[8]. This is the equivalent of roughly one and a half times the annual UK electricity production.

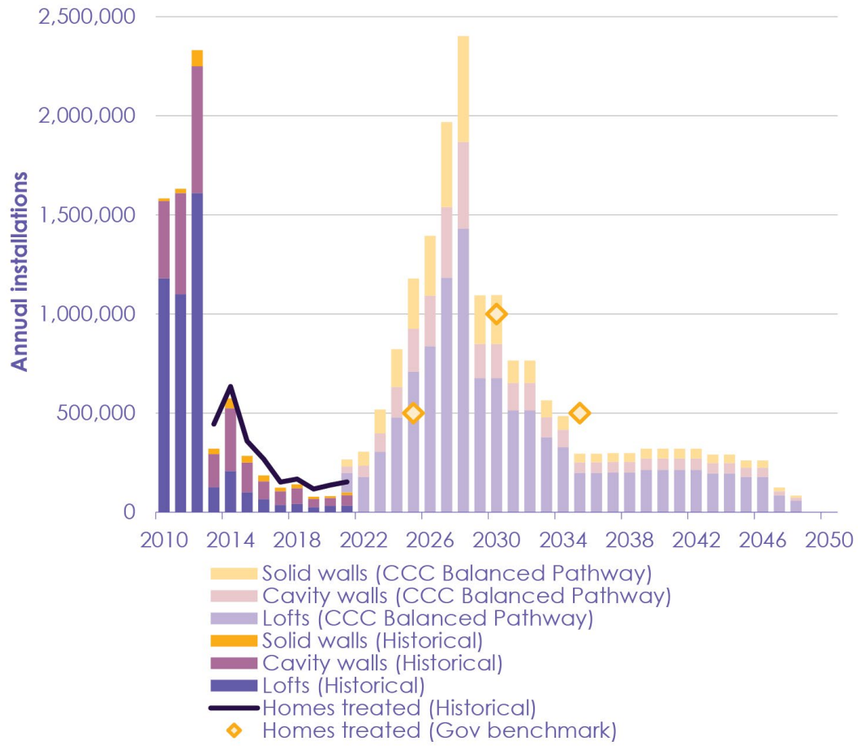
The energy efficiency programmes of this period were based on effective consultation, and mobilisation of the companies that make up the industry. In the 1990s and around the turn of the century the Energy Saving Trust (EST) was a Government funded body and played a coordinating role.

Eoin Lees, was the CEO. He said:

"Getting the trade associations onside is essential if you are going to deliver a good programme. We formed something called the Energy Efficiency Partnership which involved all of the relevant trade associations and groups such as Fuel Poverty Action. You have to be very careful to listen to what they have to say and about what they can, in a positive light, do to achieve energy efficiency objectives. One of the biggest problems in those days was getting installers trained in gas condensing boilers. We built up the skills base with paid training courses. As the programme developed it became a lot more than fuel poverty."[9]

A glance at the statistics shows up the contrast between the CERT Programme and what has happened since the CERT Programme ended in 2012. Here we reproduce two Figures. One, (Figure 3) from the Committee on Climate Change (CCC) shows the relative decline of energy efficiency programmes over the last decade from a peak in 2012. The Figure also shows what the CCC believes we need to organise in the future in order to meet carbon reduction targets necessary to achieve the net zero-by-2050 target.

Figure 3 - Home energy efficiency installations



Source: BEIS (2022) *Household Energy Efficiency Statistics*; BEIS (2021) *National Energy Efficiency Data-Framework (NEED)*; CCC (2020) *Sixth Carbon Budget;* BEIS (2021*) Net Zero Strategy: charts and tables (updated 5 April 2022)*.
Notes: Historical data includes Government data on insulation measures delivered through the Green Deal, ECO and Local Authority Delivery scheme to capture solid wall, cavity wall and loft insulations. This means not all insulation measures are captured. For the LAD scheme data we only capture insulation measures from Phase 1 as data on Phase 2 specific insulation measures is not yet published. Data on homes treated is not directly comparable with the sum total of number of loft, cavity wall and solid wall insulations, as a single house might have multiple measures, or measures other than loft, cavity and solid wall insulations.

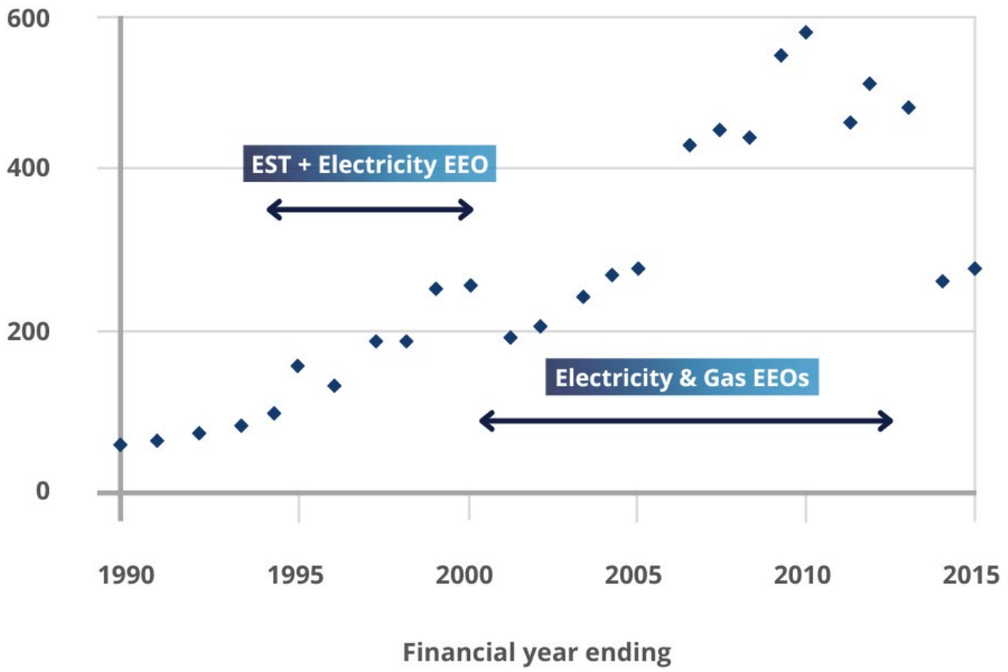
Source: Committee on Climate Change, 'Progress in Reducing Emissions – Report to Parliament June 2022', Figure 4.6 page 167

The CCC measures pictured opposite covers insulation. Effective measures also include techniques such as installing low NOx plugs to improve gas boiler efficiencies and installing auto balancing valves to improve the efficient use of hot water in radiators. Current lighting systems can be replaced by LED lights.

A second figure (Figure 4), produced by Eoin Lees, the former head of the Energy Saving Trust shows the pattern of deployment of cavity wall insulation from the 1990s. We can link up the two charts to show the trend of increasing energy efficiency deployment from the beginning of the century leading up to a peak in 2012, and decline thereafter. 2012 is the significant year since that was the last year of the energy efficiency programme set in motion by the Labour Government. The peak delivery of energy efficiency occurred during the years 2008-2012.

We can see that since 2012 the number of annual installations of energy efficiency measures has declined by over 80 per cent.

Figure 4 - Installations of cavity wall per year (1000s), 1990-2015



Source: personal communication from Eoin Lees

A second type of programme was implemented alongside CERT called CESP. Whereas CERT involved a focus by energy suppliers on implementing a number of measures, not necessarily in the same buildings, CESP involved a whole-house approach. This meant that there was a focus on particular areas where, on a street-by street basis, householders were asked to volunteer to have their houses fitted with a full range of energy efficiency measures. The Programme was designed to be rather smaller than that of CERT, and was discontinued, despite it having advantages in focussing employment and also the measures in particular areas thought to need attention. Andrew Warren commented: "CESP was a good programme in that it could deliver to a particular area with associated local employment benefits. OFGEM didn't understand it and it got killed because it wasn't a statutory programme."

How much is Labour's CERT Programme worth today?

As discussed earlier, the Labour Government organized a 'Carbon Energy Reduction Target' Programme from 2008 until its closure in 2012. In order to get an idea of what the value of a broadly similar programme might be today, we should look at what the gains will be to those houses which received the benefits. In fact the measures were spread out amongst houses – ie some houses got loft insulation, some cavity wall insulation, a few solid wall insulation and some heating controls etc. But in order to look at the effect of the Programme as a whole, I model here the impact on a house that received a package of the measures (there will be some in this category).

So, what might be the total value of the energy saving and comfort gains being felt by residents of a house fitted with a package of measures deployed under CERT? That is, cavity wall, loft insulation plus heating controls, boiler improvements etc? We can calculate the energy savings and comfort gains from the different measures at October 2022 gas prices[10]. This is shown in the Figure below compared to a poorly rated home, as indicated in the Figure below.

A house with a package of the measures in the CERT Programme will have cavity wall and loft insulation fitted, heating control and boiler improvements. They may gain an average of around 5700 kWh in energy savings combined also comfort savings (the latter from being able to heat the house warmer than they would anyway). This may be compared to a total energy consumption, before the measures, in a relatively uninsulated house, say of around 14000 kWh, in the home as indicated in the Figure 5 on the next page[11]. We can see that the value of a package of CERT energy efficiency measures to the households will be £589 at October 2022 gas prices of 10.3p/kWh (as capped by the Government in September 2022). But this does not include the savings on future payments that consumers will have to make to repay money borrowed from banks (on the Government's behalf) to stave off the worst of the October 2022 energy prices increases.

How much would a CERT type Programme cost to deliver? The CERT Programme itself cost £5.4 billion to deliver in 2013 prices[12]. That means around £6.14 billion in 2021 prices.

How much would a CERT type Programme save today? If CERT delivered around 12 TWh a year in total value to the consumer (500 TWh divided by an estimated 40 year lifetime[13]) then the total annual value to the country of the CERT Programme will be over £1200 million at October 2022 gas prices. However, we can add on at least (probably a lot more than) £300 million saved in the amount of money needed to be borrowed by the Government to keep energy prices down. In gas price terms, this is money reduced from around 15 p/kWh as calculated by Cornwall Consultants, to 10.3 p/kWh according to the UK Government price cap. Added to that will be interest charges on the money borrowed which consumers will have to repay as well. So the CERT Programme will be saving at least around £1500 million a year. So, this would repay the £6.14 billion or so outlay in just over 4 years.

The savings for each household/energy consumer are set out in Figure 5, which amounts to nearly £600. However this figure does not include money that will be saved by consumers in not having to repay so much money borrowed to keep energy prices down.

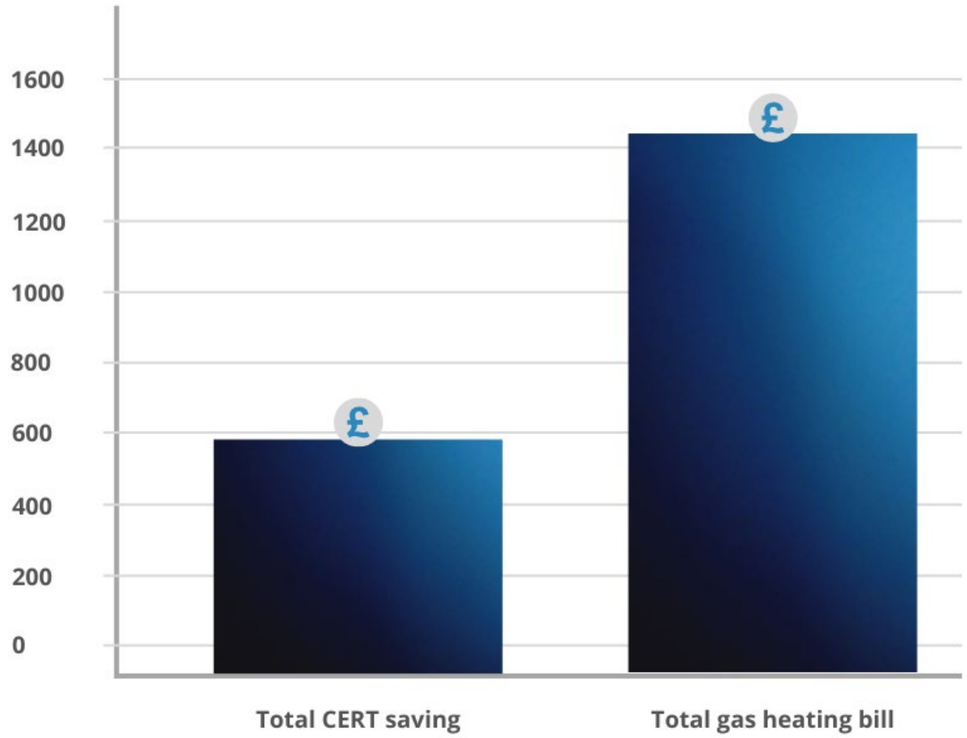
The Government has organized (and guaranteed) money to be borrowed from banks to reduce consumer bills from an approximately typical £3500 annual household bill to a £2500 annual bill. But reduced energy consumption resulting from CERT energy efficiency measures means that less money needs to be borrowed by the country to reduce the level of consumer bills overall.

However, Figure 5 does not count these reductions in the need to borrow money to fund the £2500 energy bill cap. This money (and more to cover interest payments) will have to be paid by consumers in future years after the current stage of the crisis has passed.

We can include these savings in calculating the investment payback on the money spent to fund CERT in the first place. The investment pay back period for the CERT Programme will be around 4 years at October 2022 consumer energy prices – that is if the investment had not already paid itself back, which it has since it was implemented during the 2008-2012 period.

The characteristics of a Programme as envisioned by the Committee on Climate Change would be broadly similar to CERT, albeit larger and focused mostly on insulation measures.

Figure 5 - Total CERT Programme efficiency and comfort savings for one household to total home heating bill



Assumed natural gas price for Figure 5: 10.3p/KWh (Government price cap set in September 2022). Note: without the Government's action the natural gas prices would have been around 15p/kWh.

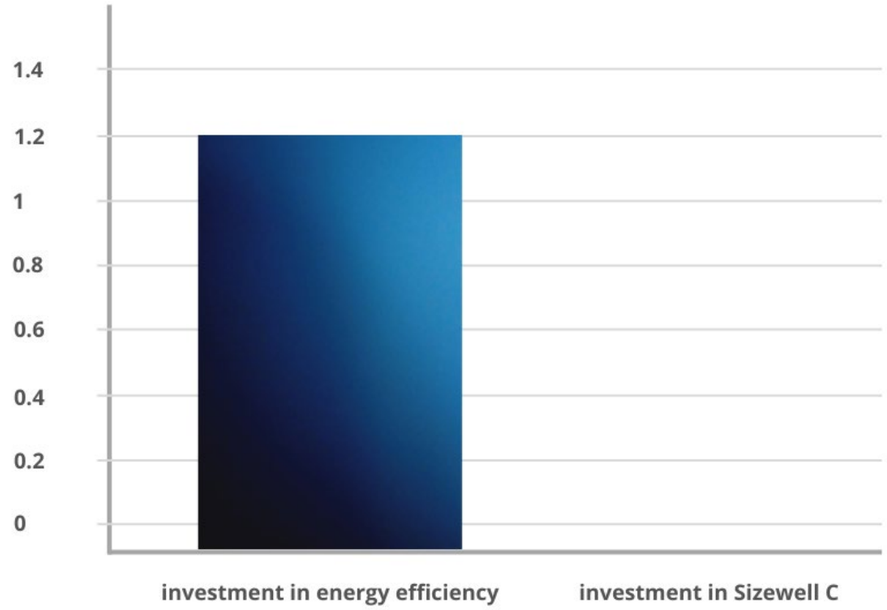
The characteristics of a Programme as envisioned by the Committee on Climate Change would be broadly similar to CERT, albeit larger and focused mostly on insulation measures. They plan that in a decade up to 2034 around 8 million houses would be fitted with loft insulation, around 2.8 million with cavity wall insulation, and around 2.5 million with external solid wall insulation (See Figure 3)[14]. This compares with the CERT Programme which fitted 2.6 mnillion cavity wall insulations, 3.9 million loft insulations, and a range of other non-insulation energy efficiency measures.

Investment in energy efficiency compared to investment in Sizewell C

In terms of the financial returns for the British public, there is no choice really. Imagine that, as is easily possible, an energy efficiency programme the size of that which the Labour Government put in place from 2008 to 2012, was put in place by 2030. As a result, in 2030 British people could earn around £1.2 billion per year if gas prices were around 10p/kWh. But if investment is being put into nuclear power they would earn precisely nothing. That's because the new Sizewell C plant, would not be completed by then. But even if it is started by the end of this decade, though it will be costing energy consumers billions a year to build, but it will not be generating until the late 2030s (if then).

While the modest costs of the initial energy efficiency programme would already be paid off by 2030 and generating large savings for energy consumers, Sizewell C would carry on costing the consumer billions of pounds a year until the late 2030s or even later. And even then it would generate power for large amounts per kWh in order to pay profits to its 'investors'. We can see the comparison between the energy efficiency and new nuclear options in Figure 6.

Figure 6 - Comparison of savings to consumers between energy efficiency of CERT style energy efficiency Programme to Sizewell C in 2030



The failure of post 2012 Energy Efficiency Programmes

When the Liberal Democrat-Conservative coalition took office in 2010 the CERT Programme was running. This was supported by legislation in the form of a statutory instrument. This legislation lapsed in 2012. However this period coincided with what has been much reported as a call from the Prime Minister (David Cameron) 'to cut the green crap'. As Eoin Lees (a former CEO of the Energy Saving Trust) put it:

"There was criticism that too much was being spent on solar farms, and there was great pressure to cut back on green energy spending. However this money for solar pv was paid for out of electricity consumer bills and was protected by legislation. But future spending on energy efficiency had no such protection and so was the only programme cut back"[15].

It should be said at this point, that although the solar feed-in tariff scheme was expensive it did, in association with the world wide support schemes for PV power, broaden the solar PV market sufficiently to herald a steep decline in the costs of solar PV.

The upshot of the policy switch was that the use of energy efficiency to reduce carbon emissions was de-prioritised.

The energy conservation obligation (ECO) was cut back and reserved only to provide energy efficiency measures to people who are in receipt of means tested benefits.

The 'Green Deal' was launched in a cost-effectiveness vein, that is to avoid use of upfront subsidies. However in fact it proved to be highly ineffective owing to the very low take up of the loans for green energy measures that were available under the scheme. A fundamental flaw was that the loans offered by the Government to pay for the measures had higher interest rates than what most people could be offered in ordinary bank loans. Eoin Lees said that 'The whole thing was designed by consultants'. This is as opposed to being designed in the light of intensive consultations and meetings with relevant industry and tradespeople[16].

The Conservatives 2019 Election manifesto featured a commitment for a large amount of energy efficiency spending - £9.2 billion in total. In the wake of this the £1.5 billion 'Green Home Grant Voucher' scheme was launched in the summer of 2020. However this failed to meet its targets, and it was scrapped early. The National Audit Office criticized it for being rushed and poorly administered[17].

According to Jan Rosenow and Louise Sutherland from the Regulatory Assistance Project: 'Ramping up the supply chain to deliver shovel ready projects at the scale planned, with only a few months' warning, was always going to be extremely challenging, especially since the shovels had been blunted for a decade by successive cuts to energy efficiency programmes'[18]. The Programme was further handicapped because there was no certainty that funding would be available for longer than a year, something that deterred industry from becoming involved.

Andrew Warren, Chair of the British Energy Efficiency Federation commented:

"Don't announce a big new Programme without setting up a long term mechanism which involves training people to do the job and also building up the number of companies able to deliver the targets. The Green Homes Grant (set up in 2020 but quickly cancelled) could have worked if the Government had focussed on how the programmes could be delivered."

Warren explained recent failures in organising energy efficiency by saying:

"It's partly to do with the fact that there isn't a separate Department of Energy. BEIS think they are about building big power stations rather than incremental energy efficiency programmes which build up and get bigger over time. I can't find anyone in the civil service who is in charge of overall strategy in energy efficiency. There's nobody there to listen and there is little knowledge of experience in the past."[19]

In fact among the nine Directorates listed as being in BEIS there are none concerned specifically with energy efficiency. However there is a Directorate (and Director General) dedicated to Energy Supply [20].

Since the ending of the CERT Programme the 'Energy Company Obligation' (ECO) has carried on in a small, fuel poverty oriented, function. The latest manifestation, supposed to be operating in 2022 (but delayed) is called ECO 4. But even for the fuel poor this is limited to those who live in homes that are below 'C' level according to the Energy Performance Certificate. In addition a) the scheme as being organised is criticised for being inflexible since it limits interventions in housing to where the biggest differences can be made.

Another aspect of the post 2012 version of the ECO policy is that because it is solely focused on limited anti-fuel poverty objectives, it tends to be expensive to deliver. Programmes that deliver energy efficiency programmes outside those suffering from fuel poverty are much cheaper to deliver since better off consumers can be offered fewer incentives than poor people to adopt energy efficiency measures. We need a programme that involves both a much larger number of the fuel poor and also a big effort to incentivise better off people to become more energy efficient. This more general approach to offering energy efficiency services to both fuel poor and more affluent people is especially needed in the time of this energy crisis, but is needed 'normally' to reduce carbon emissions and also to offer additional energy services to consumers.

The Programme should be focussed, as with the 2008-2012 CERT Programme on reducing carbon emissions. This is because the impact of the programme will last longer than the current energy crisis and in the future carbon emissions from gas heating will be much higher than the increasingly decarbonised electricity production sector.

Heat Pumps

Heat pumps are essential in the battle to reduce gas consumption and cut carbon dioxide emissions. They will reduce both gas and carbon emissions by at least two-thirds. As the difference between the domestic price of natural gas and electricity declines, so the cheapness of operating costs of heat pumps compared to gas boilers increases. The roll out of heat pumps has been greatly disappointing. The Government has published policy documents talking about 600,000 heat pump installations per year by the end of the decade, but the means to achieve this in England and Wales are not clear.

The Government has signaled that Buildings Regulations will be improved so that from 2025 fossil fuel boilers will be banned in new buildings, but the legislation to make this happen has not even been drafted. In Scotland, though, this measure has been legislated to start in 2024.

In 2021 the Government announced the 'boiler upgrade scheme' to give £5-6000 for each heat pump retrofit. The uptake of this scheme has been disappointing, and it does not seem to have boosted the uptake of heat pumps more than the previous incentives available under the Renewable Heat Incentive (whose incentives were actually higher). However removing VAT on radiators, tanks etc associated with heat pumps has been of some help.

The Heat Pump Association (HPA) has called for a training package to be offered to heating engineers, but no scheme has been forthcoming. The HPA has called for increased incentives for heat pump retrofits.

The Government has organised a consultation about a proposal to give an obligation on heating manufacturers to make a proportion of their products as heat pumps. However this will not get the machines installed, and the response of the manufacturers has been cool to this idea. What we need is a big increase in demand for heat pump installation, and then the manufacturers will be keen to support, and train engineers to install heat pumps.

This demand can be created through obliging energy suppliers to install targets for increasing numbers of heat pumps.

A programme should be launched, backed by Government incentives, to transition all district heating systems from being powered by gas engines or boilers to being powered by heat pumps. The Government was very wrong to scrap incentives for large scale heat pumps to supply energy to district heating systems.

A Heat Pump obligation on energy suppliers

First, just as there has been an 'Energy Company Obligation' (ECO) to install energy efficiency measures, there should be an obligation on energy suppliers to retrofit an increasing number of heat pumps to existing properties. This should begin with a number for installation that is well above present numbers being installed. This could be 50,000 in the first year, rising there afterwards. The cheapest route to achieving target numbers of installations can be left to the suppliers. However, initially there is likely to be a focus on properties that are not connected to the gas grid where the costs of fuel are very high.

Secondly, of course, the ban on fossil fuel boilers legislated for now, to take effect not later than 2025, preferably in 2024 as in Scotland. It should be noted that heat pumps, along with other necessary green building measures, including solar pv and batteries, are most cheaply installed in new build properties. Batteries are important to help both householders and the grid as a whole balance energy demand and solar production. Installation of such items should also be made mandatory alongside improvements in fabric efficiency up to 'passivhaus' standards[21].

Giving obligations to energy companies and builders will bring down the costs of fitting heat pumps greatly. Currently, under the retrofit scheme, there is not enough incentive on installers to reduce costs. However, giving responsibility to builders of new houses and also energy companies to install retrofits will give them a substantial incentive to reduce costs.

Summary

What makes for a good energy efficiency programme?

Drawing from the earlier discussion the following recommended points become clear.

- Appoint a Minister of State in charge of Energy Efficiency
- Set up a civil service Energy Efficiency Directorate headed by a Director General, a Senior Civil Servant grade 3 level (SCS3)
- Preferably re-establish a separate Department of Energy and Climate Change to house and coordinate these measures and institutions
- Re-nationalise the Energy Saving Trust and give it extra funds to enable it to be an effective advisor to the Government and aid its efforts to coordinate the energy efficiency industries and trades
- Set targets for energy efficiency targets for homes based on those proposed by the Committee on Climate Change (see Figure 3) – these proposals include around 8 million loft insulations, around 2.8 million cavity wall insulations and around 2.5 million external wall insulations. In addition other measures such as installing better heating controls and LED lighting should be incentivised
- The Programme should be focussed, as with the 2008-2012 CERT Programme, on reducing carbon emissions which means a main focus on reducing emissions from the gas heating sector.
  The Programme should be delivered through an Energy Company Obligation on energy suppliers
- Build up industrial and trades capacity by bringing together representatives of all of the relevant industries and companies concerned with delivering the energy efficiency objectives and produce a plan to implement programmes based on agreement with these interest groups
- Establish effective training programmes to train necessary industrial and administrative personnel
- Building up energy efficiency targets and delivery involves escalating the size and coverage to all households of the existing Energy Company Obligations on energy suppliers over time so that there is sufficient expertise and industrial capacity to deliver the targets
- Establish an Energy Company Heat Pump Obligation on the energy suppliers to deliver an increasing number of heat pump retrofits to existing properties
- Introduce legislation to effect the ban on replacement fossil fuel boilers from 2024 as in Scotland. Simultaneously fabric efficiency rules should be tightened and solar PV and batteries made mandatory on new build
- Establish a programme to transition all district heating systems to be supplied by large scale heat pumps

Appendices

Endnotes

1 In this report the terms 'energy efficiency' and 'energy conservation' are used interchangeably to mean the same thing.
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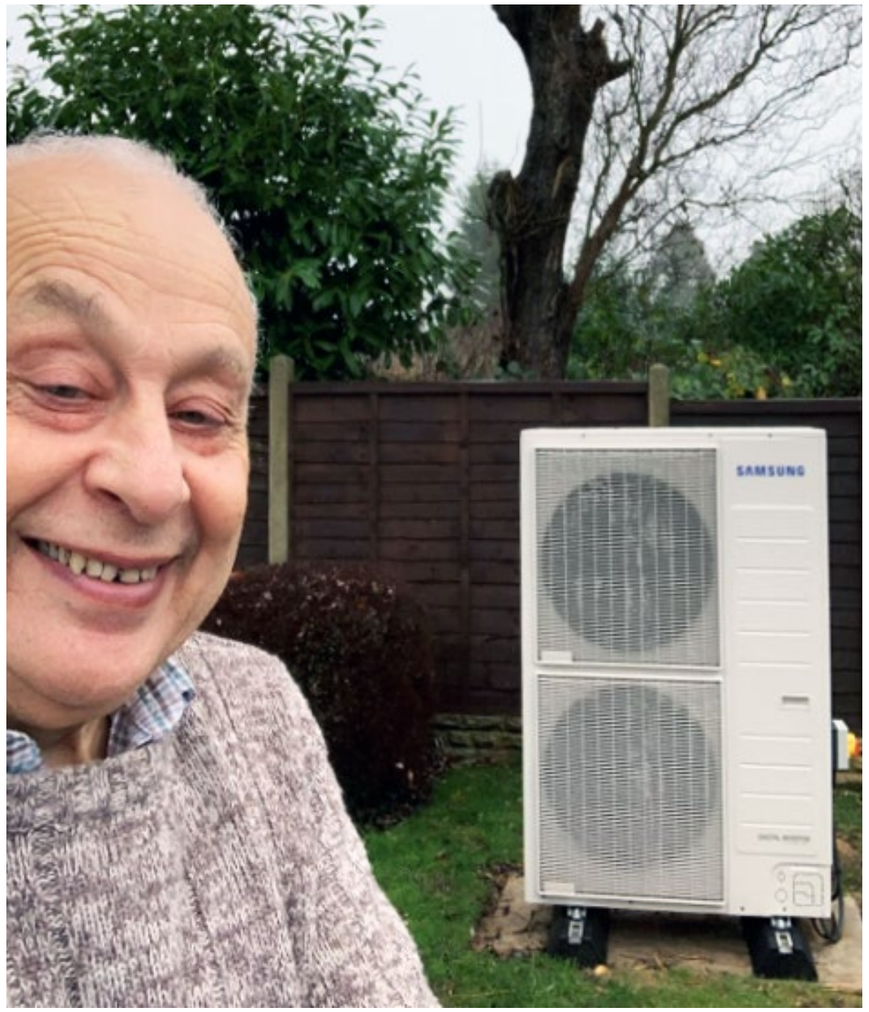

Report Author: Dr David Toke with the Heat Pump he has installed at his home.

Report Design by Hannah Cantellow Studio