

Summary: Intervention & Options

Department /Agency:
DECC

Title:
**Impact Assessment of proposals for implementation of the
Community Energy Saving Programme (CESP)**

Stage: Final

Version: 3.1

Date: 29 May 2009

Related Publications: CESP Consultation Document & summary of responses [to be published late June]; CERT Uplift Consultation Document; Heat and Energy Saving Consultation Document; Climate Change Bill Amendment Impact Assessment

Available to view or download at: www.decc.gov.uk/consultations

Contact for enquiries: **Steve Ives**

Telephone: 0300 068 5068

What is the problem under consideration? Why is government intervention necessary?

The Energy White Paper (2007) set out the long-term energy challenges we face, which include tackling climate change by reducing greenhouse gas (GHG) emissions, and ensuring affordable energy. The Climate Change Act 2008 established a long term target for an 80% reduction in UK net GHG emissions by 2050 and a system of legally binding five year carbon budgets. In the third carbon budget period (2018 – 2022), the UK has committed to reduce its net emissions of GHGs to at least 34% below 1990 levels. Improving household energy efficiency can help meet both challenges, reducing GHG emissions and reducing energy bills. However there are market failures and barriers with respect to the uptake of energy efficiency measures in homes. Government intervention which addresses these can improve overall welfare.

The Community Energy Saving Programme (CESP) is particularly focussed on barriers to the uptake of energy efficiency measures in low income areas and hard to treat homes. In these homes, there are barriers to implementing energy efficiency measures for householders including lack of capital, awareness, hidden costs and landlord/tenant split incentives. Energy suppliers are incentivised to focus on delivering less costly measures in other areas through other existing obligations on suppliers. CESP will address the dual market failures of negative externalities and information asymmetries.

What are the policy objectives and the intended effects? The Community Energy Savings Programme has the twin objective of significantly reducing the fuel bills of some of those living in deprived areas (proposed to be defined as Super Output Areas in bottom decile of the income domain of the Indices of Multiple Deprivation); and contributing to the improvement of the energy efficiency of the existing housing stock in order to reduce the UK's GHG emissions.

What policy options have been considered? Please justify any preferred option.

Four options were included in the partial Impact Assessment (IA) which accompanied the consultation document, including the 'do nothing' option as a comparator. The Government's preferred option, the 'Community approach', was supported by the vast majority of consultees. The other two options, the 'prescriptive approach' and the flexible approach are therefore not covered in this final IA. However a number of aspects of the flexible approach are common with the Community approach.

When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?

The policy will be formally reviewed at the end of the programme period. Interim reports will be made available during the programme period.

Ministerial Sign-off:

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister:

..... Date:

Summary: Analysis & Evidence

Policy Option: 1

Description: New obligation – community approach

COSTS	ANNUAL COSTS		Description and scale of key monetised costs by 'main affected groups' Cost to energy suppliers and electricity generators of delivering CESP measures, which may be passed on to customers, £311 million; Costs to other parties that will be levered in by suppliers and generators, £65 million
	One-off (Transition)	Yrs	
	£ 400 000+	1	
	Average Annual Cost (excluding one-off)		
	£ 130 million	3	
			Total Cost (PV) £ 365 million
Other key non-monetised costs by 'main affected groups' Hidden costs to householders, e.g. hassle and time costs; administrative costs on participating community groups.			

BENEFITS	ANNUAL BENEFITS		Description and scale of key monetised benefits by 'main affected groups' Energy savings for about 90,000 participating households; totalling £313 million over lifetime of measures, thermal comfort equates to £110 million; lifetime carbon savings of ca 2.9 MtCO ₂ valued at £63 million.
	One-off	Yrs	
	£		
	Average Annual Benefit (excluding one-off)		
	£ 18 million	40	
			Total Benefit (PV) £ 487 million
Other key non-monetised benefits by 'main affected groups' Publicity for suppliers, generators and participating community groups; increased environmental awareness at community level; improved performance ratings for local authorities; lasting removal of around 30-40,000 households from fuel poverty.			

Key Assumptions/Sensitivities/Risks The Government's approach to carbon valuation is currently under review; this IA uses the current Shadow Price of Carbon to value the carbon savings generated by the policy; new values, to be published shortly, will affect the value of the benefits of CESP. We cannot be sure Suppliers and Generators will deliver measures in the way our illustrative mix intends. If another way is found the carbon savings may change. (See annex D: Key assumptions/sensitivities/risks)

Price Base Year 2009	Time Period Years 3	Net Benefit Range (NPV) £ see Annex D	NET BENEFIT (NPV Best estimate) £ 122 million
-------------------------	------------------------	---	---

What is the geographic coverage of the policy/option?	GB			
On what date will the policy be implemented?	Autumn 2009			
Which organisation(s) will enforce the policy?	Ofgem			
What is the total annual cost of enforcement for these organisations?	£ 350,000			
Does enforcement comply with Hampton principles?	Yes			
Will implementation go beyond minimum EU requirements?	N/A			
What is the value of the proposed offsetting measure per year?	N/A			
What is the value of changes in greenhouse gas emissions?	£63 million			
Will the proposal have a significant impact on competition?	No			
Annual cost (£-£) per organisation (excluding one-off)	Micro 0	Small 0	Medium 0	Large 0
Are any of these organisations exempt?	Yes	Yes	N/A	N/A

Impact on Admin Burdens Baseline (2005 Prices)			(Increase - Decrease)		
Increase of	£	Decrease of	£	Net Impact	£

A short interpretative note on the summary tables is provided at Annex F

Strategic Overview

1 As a direct response to the challenge of climate change and energy price rises, the Prime Minister announced on 11 September 2008¹ proposals for £1 billion worth of measures to help families on middle and modest incomes to cut their energy bills. This included proposals for a new Community Energy Savings Programme (CESP), delivered by energy suppliers and electricity generators, delivering around £350m worth of measures to improve the energy efficiency of homes in low income areas through a community partnership approach. CESP will be complementary to existing initiatives that deliver energy efficiency measures to households.

Other related programmes

2 The Carbon Emission Reduction Target (CERT) is an obligation on energy suppliers to achieve targets for promoting reductions in carbon emissions in the household sector. It is the principal driver of energy efficiency improvements in homes in Great Britain. Warm Front, the Home Energy Efficiency Scheme and the Warm Deal and Central Heating Programme are all complementary programmes, delivering energy efficiency measures to help tackle fuel poverty in England, Wales and Scotland respectively. Decent Homes is a scheme designed to ensure all social sector housing in England meets a certain standard (including, and also going beyond, energy efficiency). Scottish and Welsh Housing Quality Standard, the Welsh National Energy Efficiency and Savings Plan, and the Scottish Energy Assistance Package are similar schemes. The Low Carbon Buildings Programme, the Community Energy Efficiency Fund and Green Neighbourhoods are also community based schemes that help build infrastructure to assist local groups to install energy efficiency measures in their own area.

3 It is important that CESP takes account of and builds on these initiatives. For example, CESP is based on the CERT legislative model, but is designed to deliver where CERT generally will not. CESP will use community partnerships to treat large numbers of homes within a given area, rather than focusing on the most cost efficient CO₂ reductions which are delivered under CERT. While CERT has a priority group to help target the most fuel poor, CESP will go further by focusing delivery in income deprived areas and often in “hard to treat” homes.

4 More generally by following a community approach local partners should be encouraged to use their expertise on the ground to look for synergies with these and other programmes and ensure CESP dovetails with related initiatives. The community approach is designed to enable this. Sixty-eight per cent of those responding to the CESP consultation supported this approach.

5 In developing its proposals for CESP the Government has engaged with stakeholders including suppliers, generators and other organisations with interests in energy efficiency, emissions reductions, fuel poverty and the environment. The Government held a stakeholder event in November 2008, with the support of the Energy Efficiency Partnership for Homes, which received contributions from a wide range of stakeholders. In addition, during March & April 2009, the Government held six national road shows to gather views on the proposals set out in the consultation document and inform the final policy decisions.

¹ www.number10.gov.uk/Page16807

The issue

6 The Energy White Paper of 2007 set out the long-term energy challenges we face, which include tackling climate change by reducing carbon dioxide emissions, and ensuring secure, clean and affordable energy. Reducing energy demand and associated emissions from homes in the existing housing stock is an important part of this. The Climate Change Act 2008 aims to help the UK's transition towards a low carbon economy and demonstrates UK leadership. The Act specifies legally binding targets for greenhouse gas emission reductions through action in the UK and abroad of at least 80% by 2050 compared to 1990. A carbon budgeting system, which caps emissions over five year periods with three budgets set at a time, sets out our trajectory to 2050. The first three carbon budgets run from 2008-12, 2013-17 and 2018-22. In the third carbon budget period (2018 – 2022) the UK has committed to reduce its net emissions of GHGs to at least 34% below 1990 levels. The Government must lay a report before parliament that details its policies and proposals to meet the first three budgets and will meet this obligation this summer.

7 Energy prices have also risen significantly over the recent period. This has led to growing concern both at the number of people who are likely to be falling into fuel poverty (as technically defined), and more generally at the difficulties many households face in managing their fuel bills.

8 The challenges of climate change and affordable energy can be addressed together, through improving the energy efficiency of the existing housing stock, to reduce both carbon emissions and fuel bills. Government intervention has begun to address this twin challenge through the past Energy Efficiency Commitment (EEC, EEC2) programmes and the current Carbon Emissions Reduction Target (CERT) programme, which placed obligations on energy suppliers to promote energy efficiency measures in their customers' homes. The EEC and CERT programmes focused on delivering the most cost effective carbon emissions savings. EEC2 delivering an estimated 72.6 MtCO₂ over the lifetime of the measures installed and CERT is expected to deliver 154 MtCO₂ (or 184 MtCO₂ with the proposed target increase), again over the lifetime of the measures installed. However, barriers remain to the uptake of energy efficiency measures, especially in hard to treat homes and in low income areas.

9 There are two particular market failures that can be identified:

- **Negative externality** – households produce carbon emissions but do not fully take account of the negative impacts their emissions have on third parties.
- **Information asymmetries** – households have incomplete information regarding energy use and energy efficiency products and the potential savings that result from them. This results in householders making poor choices.

10 The main barriers to household energy saving fall under several distinct categories:

- **Basic financial barriers:** These include the potentially higher (upfront) costs of carbon abatement products and the interest rates available to households.
- **Hidden costs:** These include “transaction costs” associated with finding reputable providers, time costs of disruption, and the costs of differences in quality of product or service—all of which may reduce the net benefit derived from efficiency measures.
- **Lack of information:** If households do not know their level of energy expenditure, how energy use can be reduced, by how much, or at what cost, they are unlikely to consider investment in energy efficiency.
- **Risks and uncertainty:** Uncertainty about future energy prices may deter households from investing, since they cannot be assured of future savings; households also may not be certain whether their tenure at a property will be sufficiently long for future savings to repay an initial outlay. In addition, households may be wary of the risk associated with new

(or unfamiliar) products or services, and they may not trust energy suppliers or others who are promoting energy saving measures.

- **Poorly aligned incentives:** The most commonly cited barrier of this kind is the “landlord-tenant split”, whereby landlords under-invest in energy-efficiency because tenants pay energy bills, or tenants do not economise on energy because the landlord pays the energy bill. Similar misalignments occur in the building industry and among property developers, often due in part to asymmetries of information. Failure to incorporate environmental or other externalities (such as energy security) into energy markets is also included here.
- **Psychological / sociological barriers:** This category refers to a range of less tangible barriers that may explain consumer behaviour that does not conform to perfect “economic rationality”. These may include inertia in decision-making (which may be due to loss-aversion and concerns about regret), the use of rules-of-thumb rather than more complicated full optimisation, and preferences that depend on the behaviour of others.
- **Regulatory barriers:** There are aspects of the energy market and its regulatory framework that could make it more difficult for households to benefit from or consider energy efficiency. Examples include limits on the types of “contracts” offered to households by suppliers, assignment of responsibility for metering, and treatment of (high-efficiency and/or low-carbon) distributed generation.

11 For energy suppliers operating under CERT, the focus on delivering the CERT carbon target at least cost has resulted in the provision of a large volume of relatively low cost measures spread over a large number of households. Suppliers have kept their costs down by targeting households which are able to contribute to the installation cost for the measures. CESP seeks to resolve the two market failures and other barriers to carbon abatement measures, and aims to help alleviate the position where low-income households face high fuel bills.

Objectives

12 CESP aims to significantly reduce the fuel bills of those living in areas with low income levels and to contribute to the improvement of the energy efficiency of the existing housing stock in order to reduce the UK’s GHG emissions. Achieving a reduction in energy use will also ensure that householders, including tenants, on lower incomes are able to heat their homes more easily which will improve their comfort and wellbeing.

Options identification

13 In order to assess the impacts of meeting the Government’s twin policy objectives of reducing carbon emissions and fuel bills in vulnerable homes four options to deliver the Community Energy Savings Programme were proposed as part of the Partial Impact Assessment, which was part of the consultation process. These were:

- Do nothing – as a baseline for comparative purposes
- Introduce new obligation on energy suppliers and generators: prescriptive approach
- Introduce new obligation on energy suppliers and generators: community approach
- Introduce new obligation on energy suppliers and generators: flexible approach

14 Responses to the consultation overwhelmingly supported the community approach and our final proposal in heavily based on this.

Partial IA Option	Community	Final
S&G on measures	£315m	£298m
Others on measures	£39m	£52m
Total measures	£354m	£350m
S&G on admin	£17m	£13m
Others on admin	£17m	£13m
Total admin	£35m	£27m
Total cost of programme	£389m	£377m
Total pass through cost	£332m	£312m
Total CO2 saving	3.9 mtCO2	2.9mtCO2
CO2 saving for lowest decile	3.9 mtCO2	2.9mtCO2*
Total households reached	~100,000	~90,000
Total households in lowest decile	~100,000	~90,000
Value of total bill savings	£44m	£33m
Average household bill saving for those households receiving measures through CESP	£440/year	£328/year

* This change from the partial impact assessment is a result of improved cost estimates for the proposed CESP measures and an improved approach to assessing carbon savings in the long term taking in to account grid decarbonisation.

Explanation of our final community approach

15 The legal basis for CESP comes from the Climate Change Act 2008. The Electricity Act 1989 and the Gas Act 1986, as amended by the Utilities Act 2000 and the Climate Change and Sustainable Energy Act 2006, contain powers for the Secretary of State, by Order, to impose an obligation on electricity and gas suppliers to achieve carbon emissions reduction targets.

16 The Climate Change Act has amended the Gas Act 1986 and the Electricity Act 1989 to all the Secretary of State to:

- place an obligation on energy generators;
- place more than one obligation on energy suppliers and generators simultaneously; and

- specify the areas in which these obligations must be met.

17 These amendments allow the Secretary of State to place a new carbon reduction obligation on suppliers and generators in addition to that already placed on suppliers under CERT². This new obligation has the same fundamental legal basis as CERT but will be implemented via separate secondary legislation.

18 The overall target for the CESP obligation will be specified in the legislation in terms of a carbon points score target equivalent to 12.5% of the original CERT target (i.e. 19.25 million lifetime tonnes of CO₂ points score). This overall carbon points target will be split between supply and generation companies, giving each obligated company an individual carbon points target. The community approach is designed to ensure the provision of around £350m of carbon abatement measures.

19 Each measure available under CESP will have an associated points score. This score is based upon the lifetime CO₂ savings provided by the measure and the desirability of that measure in terms of achieving the CESP objectives. Every time a supplier or generator implements a measure they receive a score which counts towards their overall CO₂ target.

20 The community approach has three main elements which are described below.

Partnership working: it is envisaged that suppliers and generators will work in partnership with local authorities and other community organisations where appropriate to promote measures, through a ‘community approach’. It is proposed to leave maximum flexibility to allow for different partnership structures and for a variety of bodies to participate. It is envisaged that the advantages of partnership working would essentially be to allow CESP to be implemented in the way best suited to conditions in individual areas and to help ensure coordination with existing programmes and initiatives noted above, and with any other local regeneration initiatives that have (or plan to have) an energy efficiency element.

Whole house, intensive approach: suppliers and generators would be encouraged to promote as many measures as possible (from a limited list), that would make the most significant reductions to fuel bills and CO₂ emissions and that are needed in each targeted home - a ‘whole-house approach’. This will be done through the ‘scoring’ of measures to incentivise this way of working³. This type of approach will require targeted domestic energy users (householders) to be offered a complete whole-house package of measures. CESP is therefore intended to incentivise more than just the less costly, possibly more cost-effective measures (as are currently delivered under CERT). The aim would be to promote the best combination of measures which are most likely to have the greatest effect in improving the energy efficiency, or lowering the energy consumption, of the whole property and thus reducing carbon emissions.

The measures which the Government proposes to be available under CESP are:

- Solid Wall Insulation (external)
- Solid Wall Insulation (internal)
- Cavity Wall Insulation
- Virgin Loft Insulation (includes anything less than 60mm existing)
- Loft Insulation Top Up
- Under floor insulation
- Flat roof insulation
- Draught proofing

² See Climate Change Bill Impact Assessment

³ See Annex C

- High Efficiency glazing
- Fuel Switch (to gas)
- Replacement of old boilers (G rated)
- Connection to a district heating scheme
- District Heating System Upgrade
- District Heating Heat Meter for Individual House Billing
- Ground Source Heat Pumps
- Air Source Heat Pumps
- Micro-generation (PV, Solar Thermal, mCHP, biomass boiler, micro wind, micro hydro)
- Heating Controls with a new heating system
- Home Energy Advice

Following consultation, the list of measures was amended to include recommendations from stakeholders. These extra measures are included above.

21 A second element of the whole house, intensive approach is that measures should be delivered through intensive action in specific areas. The aim of CESP is to provide measures to communities in low income regions, rather than targeting individual households anywhere in the country.

22 **Low income targeting:** CESP will target those areas of the country that have significant levels of low income households.

It is these areas that have the densest concentration of households in need of assistance, since energy efficiency improvements will result in permanent fuel bill reductions. It is envisaged that the design of the programme means that suppliers and generators have to offer measures for free, or at a very low cost, in order to meet their obligation. However, in line with the approach taken under CERT, it is not proposed to prescribe in the legislation that all measures have to be delivered for free.

23 The advantage of this lies in the balance of flexibility for suppliers and generators and the certainty with regard to outcomes. By specifying the parameters within which suppliers and generators can operate, but leaving it up to them to choose specific areas and measures, desirable outcomes will be delivered in a cost-effective way which maximises synergies with existing programmes and community partnerships.

24 Because CESP is focused on more significant measures that tend to be more expensive than those that are typically delivered under CERT, it will deliver to fewer houses for the same cost. However those houses that benefit will experience significant reductions in energy demand and CO₂ emissions and hence will benefit from significant fuel bill savings. Further, by driving the installation of currently expensive measures we can expect costs in the longer term to be reduced. This trade-off of greater savings to fewer people is inevitable in a scheme that encourages a whole house approach and the installation of more expensive measures.

Analysis

General sources of evidence

25 The Climate Change Programme Review of 2006 and the Energy Review of 2007 looked at programmes targeting households as well as those targeting industry, transport and other sectors relevant to the Government's climate change and energy objectives. Those reviews considered progress towards targets, options for improving performance, and a large body of evidence on the cost-effectiveness of different programmes.

26 The results suggest that household energy programmes, both as a group and individually, were among the more cost-effective measures available to reduce the UK's carbon emissions. This is largely because financial savings per tonne of carbon saved were found to be greater in the household sector than in others. This view is supported by the National Audit Office in their report on Government programmes to reduce household energy consumption (published in July 2008, www.nao.org.uk/pn/07-08/0708787.htm).

27 The Energy Efficiency Commitment (EEC) was in operation from 2002-2008 and was preceded by the Energy Efficiency Standard of Performance. A large amount of evidence has been accumulated over the years, partly based on experience and evaluation, and partly based on a programme of commissioned research carried out to address specific issues. Much of this evidence is available on the Defra website (www.defra.gov.uk/environment/climatechange/uk/household/supplier/eec.htm), and in Ofgem quarterly updates and annual reports on EEC and CERT. Evidence on energy efficiency policies was presented as part of the Energy White Paper 2002, the Energy Efficiency Action Plan 2004, the HMT/Defra Energy Efficiency Innovation Review 2005, the UK Climate Change Programme Review 2006, the Energy Review 2006 and the Energy White Paper 2007. In addition, there are several data sources that are collecting relevant information on an ongoing basis and are published regularly, such as the English House Condition Survey and the Domestic Energy Fact File.

28 Current and former obligations (CERT, EEC, EEC2) have resulted in carbon savings for the households taking advantage of the programmes, and suppliers have been able to focus on the most cost-effective carbon reduction measures. However, there has been no specific incentivisation of a whole-house approach through these programmes. By focusing on more than one measure within a home – the whole-house approach – the carbon and fuel bill savings within that home would be greater, and have a greater impact on addressing fuel poverty (Detail on what the whole house approach might mean in practice is provided at Annex C). Once the suppliers or generators have gained access to a home to install a certain measure, the marginal administrative cost of implementing further energy efficiency measures decreases. However the marginal cost of further improvements in the energy efficiency of the house is likely to rise as the most cost-effective measures are exploited and further improvements require less cost-effective measures to be implemented.—. For the householders, the benefits of the whole-house approach would be not only more significant fuel bill reductions but also less hassle from fewer visits and contacts with suppliers.

29 There is also evidence supporting the delivery of household energy efficiency measures through a community approach. British Gas 'Green Streets' experiment has helped families cut CO₂ by 20% and energy use by up to 30% in just over five months, through energy saving measures, neighbourhood energy advisers and by introducing elements of competition into energy saving⁴. The final evaluation of the Warm Zones pilots provides further support for a combined whole-house, community approach as a cost effective means of reducing fuel bills in low income homes⁵. Given the likelihood of similar dwelling types within a street or community, a community approach would have the additional benefit of minimising search costs which are likely to increase as measures become more expensive or intrusive (such as solid wall insulation), as well as increasing cost-effectiveness through economies of scale (for suppliers and generators, who can benefit from doing several houses at once). Targeted groups of houses within a locality can usefully act as demonstration projects of community action and community-led solutions. There is also the possibility to tap into existing networks of knowledge, such as local authorities

⁴ <http://www.ippr.org.uk/research/teams/project.asp?id=3027>

⁵ http://www.warmzones.co.uk/c_archived_news.html

and regional Energy Saving Trust advice centres, and the potential to pool funds from a range of sources to leverage wider financial support from within the community.

30 The Sixth Annual Progress report, published October 2008, for the UK Fuel Poverty Strategy provides the fuel poverty figures across the UK for 2006. The figures show there were approximately 3.5 million households in fuel poverty across the UK, an increase of 1 million households since 2005. Around 2.75 million of these are vulnerable households, defined as a household which contains children, the elderly, or somebody who is disabled or long-term sick.

31 The rise in the number of households in fuel poverty during 2006 was due to increases in consumer energy prices. The overall cost of energy to domestic consumers rose by 22 per cent in real terms between 2005 and 2006, with gas prices rising by 29 per cent and electricity prices rising by 19 per cent. There have been further energy price rises since then.

32 The Standard Assessment Procedure (SAP) is a means of determining the energy efficiency standard of a dwelling. It uses a scale to measure the heating and insulation characteristics of a property, with higher numbers indicating a better energy efficiency standard. Looking at SAP ratings, the average SAP value is very similar across all income deciles, although it does tend to drop as income rises. The average SAP rating is however slightly misleading. There are more dwellings with SAP > 65 in the lower income deciles (compared with the higher deciles), but the proportion of lower rated dwellings is similar across the income deciles.

33 More detailed information on the potential fuel poverty implications of the programme is contained in Annex B. Annex C contains detailed information on how the carbon savings are calculated, how measures have been scored, and how the uplifts to encourage whole-house and street-by-street approaches have been applied.

Costs and benefits by main affected groups

Costs

34 Costs on suppliers and generators are estimated at £298 million towards measures and £13 million towards administration costs, so the total cost to the suppliers and generators is estimated to be £311 million. Given the greater flexibility of this option we assume there is more (but still limited) scope for the companies to receive contributions towards their costs from able-to-pay customers or from other sources such as local authorities and community groups. These contributions might be financial or in the form of local knowledge or local action on the ground. We assume the value of these contributions to be roughly £65 million.

35 If the obligated companies pass through all their costs to their customers, this would equate to price rises on average annual domestic energy bills of around £3.00 for the duration of the programme. For industrial customers the increase in unit cost is likely to be below 1%. Price rises of this order might shift 20,000 to 30,000 households into fuel poverty, as technically defined (assuming for these purposes that the scheme lasted three years, and that extra costs were incurred and passed on during this period only). There will of course be a compensatory effect as some of the households targeted under the scheme move out of fuel poverty in the short term and (to a greater extent) the long term as a result of the sustained energy efficiency improvements they will experience. Annex B provides greater detail on the fuel poverty effects of this. .

36 The administrative costs faced by suppliers and generators are difficult to estimate but could include:

- Project development: relating to the development of schemes up to the point of submission and approval.
- Project facilitation: after approval, getting the schemes off the ground, liaising with managing agents and other parties, etc.
- Grant administration: processing claims and payments
- Monitoring: monitoring of the energy quality and customer satisfaction
- Evaluation and reporting: assessing the impact of schemes and reporting

37 For an explanation of administration costs and how these are passed through to customers refer to Annex A: Administration and Pass Through Costs.

38 The costs of the scheme which fall to the energy companies are likely to be passed on to their customers (domestic and industrial). Consultees expressed a concern that there was an unfair obligation placed on independent generators, who are unable to pass costs on as easily as vertically integrated generators. However, this impact assessment assumes for the purposes of quantification that 100% of the costs are passed through to customers, over a three year period. Of the programme costs, £210 million are therefore be passed through to domestic customers and £103 million to industrial customers⁶ (£311m in total). See Annex A for more detail.

39 Ofgem will administer and manage the scheme, as they do with CERT. Although CESP will be a much smaller scheme overall, Ofgem believes its enforcement costs will be proportionally greater. Ofgem has provisionally estimated a £400,000 one-off cost associated with the set up of the scheme (including for example development of IT to administer the programme) and then an annual enforcement cost of around £350,000. We are currently working with Ofgem to finalise these estimates in light of final decisions on CESP.

40 We assume there will be hassle and disruption costs, as well as potential environmental costs to householders. All households will participate voluntarily and they would therefore necessarily be taking the view that any disruption or loss of amenity was outweighed by benefits received. Nonetheless, several of the possible CESP measures will cause some disruption to the householder, in the short term (e.g. need to clear out the loft) or longer term (reduction of space with some forms of solid wall insulation). It is difficult to quantify this “hassle factor”, but it may be greater where householders have less control or choice over which particular measures are offered to them. For internal solid wall insulation, the hassle costs would be significant for the householders, as this would require clearing out rooms and redecoration.

41 CESP will be delivered in partnership with local authorities and/or community groups, but proposes to leave the arrangements flexible, with no element of compulsion. Participating local authorities will be self-selecting and, it is reasonable to assume, will support the programme in the most cost-effective ways that they can for the benefits they will achieve. It is difficult to assess at any general level what sorts or levels of costs they might choose to incur. Similarly, there may also be impacts on other parts of the third sector.

Benefits

42 Suppliers and generators would be likely to gain some social benefit through publicity and brand awareness from their participation in the scheme, although this could be less for generators than for suppliers as they do not have a domestic customer base and may therefore have less direct interest in fostering consumer awareness. It is difficult to quantify this effect, but it would be likely to be greater under a less prescriptive model where companies would have some flexibility to select areas which were important to them in a business sense. Other benefits

⁶ See Annex A and B

include energy security of supply, reduced infrastructure needed, reduced UK balance of payments deficit, improved housing stock and other social benefits, such as call on NHS services.

43 We estimate that the average fuel bill saving per household receiving measures under this option to be on average £328 and a total annual fuel bill saving of £33 million for the estimated 90,000 participating households. (These assumptions are set out further in Annex C). We therefore estimate the lifetime fuel-bill reductions from these measures at roughly £624m. Some of the measures might also increase the value of the properties concerned.

44 Although not formally part of CESP, benefit entitlement checks may well be offered to participating households in parallel. These can produce very significant increases in income, with experience from the Warm Front programme suggesting average annual income increases of around £1,400 for those found to be under-claiming.

45 The nature of the targeted areas means that the assisted households are likely to have a much greater initial propensity to fuel poverty than average. Fuel bill savings might remove around 30-40,000 households from fuel poverty, as technically defined (see Annex B). Because of the significant size of the fuel bill savings, this would lift households out of fuel poverty and protect them from falling back into it as a result of future price rises.

46 In practice, householders may take some of the benefits of the scheme in the form of improved thermal comfort (comfort taking), i.e. in light of the reduced fuel bills they feel able to afford to heat their homes at their preferred level. We have assumed that comfort taking reduces the emissions savings by 40% for all insulation measures, as opposed to the 15% assumed in CERT calculations. Given that CESP focuses on hard to treat homes in income deprived areas, the larger figure seems appropriate⁷(see Annex B).

47 Social benefits may include a greater sense of engagement with the community, through the area focus of the scheme, which may have knock on benefits both for further environmental activity at community level. However, the fact that the communities concerned would be essentially self-selected might lead to greater benefits in terms of informed and sustained engagement at local level

48 Local authorities in targeted areas may benefit from improved assessments against the local government performance, which includes indicators on both area wide carbon reductions and fuel poverty (national indicators 186 and 187). There may also be some social benefit through publicity and brand awareness from participation in the scheme, for local authorities and/or other community groups.

49 The insulation and energy efficiency installation industry is set to benefit through increased demand for their products and services. The increased market could lead to new entrants to the sector, and greater competition, making the sector as a whole more efficient in the longer term. There may also be benefits in terms of employment effects and an increasingly skilled workforce.

50 By virtue of participating in the scheme, householders are also likely to become more aware of energy efficiency issues, and be better placed to make behaviour changes which will help them control usage, and cost, in the future. The impact may depend on the extent to which certain types of measure, e.g. home energy advice, are included within the scheme.

⁷ www.apho.org.uk/resource/view.aspx?RID=53281
<http://www.defra.gov.uk/environment/climatechange/uk/energy/research/pdf/insulationmeasures-review.pdf> (page 16)
<http://www.eci.ox.ac.uk/research/energy/downloads/40house/chapter04.pdf>

51 The estimated total lifetime carbon savings under the programme amount to 2.9 Mt CO₂, valued at £63 million. This is made up of 1.6 MtCO₂ of traded sector reductions and 1.3 MtCO₂ of reductions in the non-traded sector. Further information is provided later in this document.

Risks

52 There are uncertainties and risks associated with introducing CESP. For example, there is a risk that it could push some households into fuel poverty for the duration of the policy as a result of companies passing their costs through onto energy bills. However, this depends on how much of their costs the companies pass through to customers, income growth and how much fuel prices and individual fuel bills change. There is also the potential for unintended consequences and perverse incentives for the suppliers and generators. There is a risk that the definition of communities, low-income households and hard-to-treat homes may allow for loopholes for suppliers and generators to operate in ways which were not the policy intention of the programme. More generally, there is a great deal of uncertainty surrounding estimates of the overall administration costs, since the programme is new for the parties concerned

53 There is a risk that introducing new powers might make investments in the energy supply and electricity generation markets less attractive, although, we believe this risk is small. There is uncertainty relating to placing a new obligation on generators for the first time, uncertainties associated with placing an additional obligation on suppliers, and uncertainties associated with introducing area based obligations.

54 There are some key risks. First, the households may not want to have the expensive measures installed in their homes if they believe there will be disruption to their living arrangements. Second, a major risk for the programme under this approach concerns our lack of firm knowledge of the costs to suppliers and generators of installing measures. This might mean that the illustrative mix proves not to be a good approximation of what will be delivered. The proposed design of the scheme includes strong incentives to reward a whole-house and whole-community approach but - if costs of measures differ significantly from our estimates - these rewards might not always be sufficient to outweigh the cost advantages to the companies of alternative more scattered approaches, and the policy objectives might not be met in full. There is another risk associated with able to pay households, in that suppliers and generators might target these households as they may present the least cost way of meeting their obligations. However, the scoring system is intended to work in such a way as to overcome this risk, and in relevant circumstances to allow CESP and CERT, for example, to work in tandem to help identify the homes that are able to pay and unable to pay and assign the allocation of measures accordingly.

55 There is uncertainty associated both with the number of households that may fall into fuel poverty for the duration of the programme, as this depends not only on fuel prices and individual bills but on other factors too, and the number of people that may be taken out of or pushed into fuel poverty as a result of the programme.

Enforcement

56 Ofgem will be responsible for the enforcement of each of the suppliers' and generators' obligations. The obligation imposed upon each supplier and generator under the CESP Order will be a relevant requirement of the supplier's and generator's electricity or gas licence.

57 The enforcement provisions allow Ofgem to make such Orders as necessary to ensure compliance with the obligation and/or impose a financial penalty. If suppliers and generators fail to meet their target the consultation proposes they be subject to a penalty, namely up to 10% of global turn-over.

Conclusion

58 Consultation has informed and supported the Government's preference for the community approach. We believe this best balances the need to achieve the twin objectives of reducing fuel bills in hard to treat homes in areas of low income and reducing carbon emissions from the existing housing stock, while at the same time retaining sufficient flexibility for suppliers and generators to deliver the programme cost-effectively. Although this option does not give the greatest CO₂ savings, it does present the best overall option. We believe this approach will also deliver the greatest synergies with the wide range of complimentary initiatives – both nationally (e.g. CERT) and at local level.

Target

59 The overall target for the CESP obligation will be specified in the legislation in terms of a carbon points score of a proposed 19.25 million lifetime tonnes of CO₂ (equivalent to 12.5% of the original CERT target). This overall carbon points target will be split between supply and generation companies, giving each obligated company an individual carbon points target. (It is important to note that 19.25m will be a *notional* carbon savings figures. The real carbon savings delivered are likely to be around 2.9MtCO₂).

60 This target is set in such a way as to be challenging for the supply and generation companies to meet and yet not impossible to deliver upon. We calculate that it will cost roughly £350million spent on measures to achieve this.

61 To put a target set at this level in context, we have also considered what the outcome could be across a range from £500million to £200million. We have only considered these outcomes in relation to the community approach because we feel it delivers on the CESP objectives in the most cost efficient way.

62 Were the target to be set at £500million, the potential pass through costs to customers' bills would rise to £13.50, if fully passed on, which would consequently increase the number of households shifted into fuel poverty over the duration of the programme (see Annex 2). Further it is important to recognise CESP's position in relation to other energy efficiency schemes such as CERT and Warm Front. If the CESP target were set this high the programme might become disproportionate in size for what it is attempting to achieve. The larger national project of this kind is CERT. CESP should work to complement CERT, not become a competitive programme.

63 Were the target to be set at £200million, the carbon savings that CESP could deliver would be heavily reduced. The estimated 2.9MtCO₂ reduction under the £350million target on our preferred option would be reduced to an estimated 1.7MtCO₂ if the target were set at £200million and the community approach used. That is a potential loss of 1.2MtCO₂ saving. Further, a much smaller percentage of households living in the lowest income decile would be reached. A programme of this scale would have a much smaller impact on fuel poverty, and contribute relatively little towards meeting the 2020 target of reducing GHG by at least 34% relative to 1990 levels.

64 The £350million target is felt to be the most appropriate, balancing the need for a significant step forward in tackling energy efficiency within the existing housing stock with the need for an achievable target for suppliers and generators that simultaneously protects customers from high pass through costs. We consulted on the appropriateness of this through the consultation document.

Implementation

65 Milestones are:

- Consultation phase February 2009 – May 2009
- Summary of consultation responses published: early Summer 2009
- Lay draft Order before the House: early Summer 2009
- Order comes into force: Autumn 2009

Monitoring and evaluation

66 Ofgem will be responsible for the monitoring of suppliers' and generators' performance in meeting their CESP obligations. Ofgem will be authorised to require information from suppliers and generators about their proposals for complying with any aspect of their obligation and their progress towards achieving it. Ofgem will be required to provide an annual report to the Secretary of State on suppliers' and generators' progress towards meeting their targets.

67 Given the relative novelty of the CESP programme and its potential benefit for informing future approaches to tackling energy efficiency issues on a national scale, it has been suggested that these reporting and monitoring arrangements might be more detailed than for the existing scheme, CERT, to ensure that the maximum possible information is received to help assess its progress as early as possible.

68 The Government is also considering the precise mechanisms for reviewing the scheme during and at the end of its life, but will ensure that it is thoroughly evaluated.

Specific impact tests

Climate Change Policy Cost-Effectiveness Indicator

69 All Impact Assessments that estimate changes in CO₂ emissions in excess of either (i) 0.1Mt CO₂e average per year for an appraisal of less than 20 years, or (ii) 2.0Mt CO₂e over the lifetime of an appraisal of more than 20 years are required by PSA Delivery Agreement 27, Indicator 6 to undergo a Climate Change Policy Cost-Effectiveness analysis. This involves measuring the proportion of tonnes of CO₂ abated, for which the cost falls below the Shadow Price of Carbon (SPC) (or EU ETS Allowance Price) once weighted and discounted. The stream of benefits for all approaches are over 20 years and are above the minimum thresholds of 2.0mt/ CO₂e lifetime and 0.05mt/ CO₂e for annual savings.

70 The policy based test applied to the Community approach yields a result where 100% of emissions are below the SPC. The cost effectiveness indicator (CEI) for this approach in the non-traded sector and traded sector was then set against the weighted average discounted shadow price of carbon (WAD SPC) and weighted average discounted EU allowance (WAD EU A), respectively. The results are shown below:

71 In the non-traded there was a WAD SPC of £22.36 with a CEI of -£58.99. This means that 100% of emissions fell under the SPC. In the traded sector the WAD EU A was £22.03 and the CEI was -£54.54. This again means that 100% of emissions fell under the EUA.

72 It should be noted that there is a strong element of uncertainty in the figures. Conservative assumptions have been made on the material costs to suppliers and generators of meeting their obligations, so these costs may turn out to be lower *ex post* than stated in this IA. On the other

hand, hidden costs to households associated with the disruption caused by having installations in their homes have not been valued.

Security of supply	✓
Technological development (Innovation externality)	n/a
Meeting the EU renewables target	✓
Meeting the EU biofuels target	n/a
EU Directive Requirements	n/a
Other (please specify below)	n/a
<p>If you have ticked any of the boxes please provide an explanation of how and to what extent the non-monetised benefit applied to this policy/measure: CESP is designed to help improve the security of supply for the UK by reducing energy consumption and therefore energy demand especially amongst low-income households. It is not specifically designed to increase renewable uptake but there may be an increase if suppliers and generators deem these small scale renewable to be effective means of abating carbon emissions and reducing fuel bills in low-income households.</p>	

72 It should also be noted that the Government’s approach to carbon valuation is currently being revised, with a new approach due to be published shortly. This will affect the valuation of carbon benefits in this IA, and the overall cost benefit assessment. However, given the value of other benefits (notably energy savings) accruing from this policy the new carbon values will not affect the overall conclusion that there is a net benefit to the introduction of CESP.

Equity and fairness

73 One of CESP’s aims is to help families on low incomes to significantly cut their energy bills. The programme aims to address the problems faced by lower-income households who face high fuel bills. Those on the lowest incomes are often the least able to pay for measures to increase the energy efficiency of their homes and therefore lower their fuel bills. This is why CESP is focusing on this societal group. However, it must be recognised that allowing the funding of the programme to be passed on to the generality of energy bill customers is potentially regressive, and some households may be shifted into fuel poverty as a result of this. However, this will only be for the duration of the programme, whereas those who have been lifted out of fuel poverty are likely to enjoy lower fuel bills for many years. CESP is estimated to be broadly fuel poverty neutral for the duration of the programme, but with the benefits continuing after the programme end for participating households.

74 More generally there may be some concerns about any programme which asks the majority of consumers (not just those technically in fuel poverty) to subsidise improvements for the few, given that all consumers are facing rising bills. However, CESP has been designed so that those who are receiving the subsidies are generally the most in need.

75 Any area-based scheme will inevitably produce winning and losing areas. The design of the programme ensures that all areas potentially targeted will meet objective and defensible criteria for inclusion, and the specific areas for action will be selected by the companies to a large extent as a function of the willingness of the communities concerned to get involved. However, it is the case that there will be abrupt boundaries on the ground, where households in one street may get assistance, and those in the next street (who meet similar criteria) do not. This could lead to perceptions of unfairness, but there is no obvious solution to this given that it is a resource-limited programme.

Competition issues

76 Competition issues arise in two different markets – the market for energy and the market for energy/carbon saving measures. CESP as proposed does not create any barriers to entry into the market for the supply of electricity or gas. However, since it is an obligation on suppliers and generators, it does raise the entry costs, although these costs may be passed through to consumers.

77 We propose that suppliers' and generators' individual CESP obligations should be based on their size. In order not to deter new entry by small firms, and to reflect the relatively higher costs incurred by small companies, it is proposed not to impose an obligation on energy suppliers supplying less than 50,000 customers or on electricity generators who generate less than 10TWh/yr of electricity. However, it must be noted that the use of a threshold could create barriers to expansion as it will represent a significant cost to small suppliers who want to expand their business activity. An Ofgem report⁸ highlighted that firms below this sort of supply threshold often fail after a few years.

78 Suppliers and generators will be able to pass on the costs of their obligations under the CESP. A supplier or generator that is inefficient in its delivery of programme objectives or that increases its prices simply in order to increase economic rent is likely to lose customers. Suppliers and generators have an incentive to keep the costs of their obligations under CESP as low as possible in order to minimise the amount of any pass-through. This reflects the competitive market and the drive to retain or acquire customers. There is therefore an incentive to be competitive in the supply of energy/carbon saving products and services. Barriers to entry into the market for most efficient energy/carbon saving products and services are relatively low.

79 While some suppliers or generators may choose to undertake a large proportion of their obligations through in-house contractors, there is no reason to suppose this will reduce competition in the rest of the energy supply or electricity generation market. In fact competition may increase slightly among smaller firms in the insulation/energy efficiency installation sector.

80 Given the size of CESP and the nature of the measures proposed, we do not envisage any supply issues for carbon abatement products, installation or development arising as a result.

81 Some generators form part of a vertically integrated unit with suppliers; others are independent and have no particular link through to domestic consumers. It has been suggested that the former type of company will find it easier to meet their obligations than the latter, since the integrated generators will have at least indirect experience of the current CERT scheme (arguably reducing their set up costs), and will have better channels through to households.

82 It is likely that independent generators may face a steeper learning curve at the start of the programme, but for a variety of reasons it seems unlikely that costs on an ongoing basis will be materially greater for these companies than for others, for example because of the ease with delivery on the ground may be subcontracted to a third party. Other features of the scheme (e.g. the possibility of buying in credits (up to 100%) from other parties, or trading away up to 100% of the underlying obligation) should also reduce any difficulties they may face. For these reasons, we do not believe that there will be any material impact on competition between independent and other generators caught by the scheme.

Small firms impact test

⁸ <http://www.ofgem.gov.uk/Markets/RetMkts/ensuppro/Documents1/Energy%20Supply%20Probe%20-%20Initial%20Findings%20Report.pdf>

83 The proposals will not impose costs on small businesses. The proposals do not apply to new and small energy suppliers with fewer than 50,000 customers and electricity generators of less than 10TWh/yr generation. This means that new entrants would not have to set up CESP programmes while at an early stage. CESP also contains other provisions that should avoid the risk of creating barriers to new entrant companies: for example, allowing suppliers or generators to buy in credits achieved by other parties as a way of meeting their own targets; and consultation on the possibility of allowing them to trade away a proportion of their underlying liability.

Race equality, gender equality, disability equality

84 Under CESP there will be opportunities for consumers to benefit from the measures, regardless of race, gender or disability, and no obvious issues are expected to arise.

Rural proofing

85 CESP has been specifically designed to assist vulnerable households to achieve CO₂ savings and permanent fuel bill savings. Following consultation DECC has decided to retain the income indicator of the Index of Multiple Deprivation, which is an established, transparent and objective means of identifying the poorest communities for targeting CESP. Under this measure, the majority of deprived households are in urban settings, with only a small number containing rural communities. The Government appreciates that this approach limits the number of deprived individuals and households in more dispersed rural settings (as well as many households in urban areas), who do not fall in the criteria of the lowest income decile of the IMD (or 15% in Wales and Scotland).

86 Some respondents suggested that action should be taken to ensure a spread of projects across the country, including in rural as well as urban areas. After careful consideration of all the responses, we have concluded that it is right to avoid an over-prescriptive approach and to leave the scheme participants with the flexibility to target those areas where they can form the most effective partnerships at local level. However, if CESP is to have its maximum value, it is important that it should foster a reasonable spread of different types of project, in different types of location, and the Government therefore expects that obligated companies will seriously consider targeting action at a variety of different areas around the country, including rural areas. We will facilitate contacts where this would be helpful and will monitor and evaluate all schemes to ensure that any lessons relevant to rural delivery are considered in future policy development.

87 The Chief Economist of DECC has reviewed this impact assessment and considers that it represents a reasonable assessment of the costs and benefits of the leading options.

Specific Impact Tests: Checklist

Use the table below to demonstrate how broadly you have considered the potential impacts of your policy options.

Ensure that the results of any tests that impact on the cost-benefit analysis are contained within the main evidence base; other results may be annexed.

Type of testing undertaken	<i>Results in Evidence Base?</i>	<i>Results annexed?</i>
Competition Assessment	Yes	No
Small Firms Impact Test	Yes	No
Legal Aid	No	No
Sustainable Development	No	No
Carbon Assessment	Yes	No
Other Environment	No	No
Health Impact Assessment	No	No
Race Equality	Yes	No
Disability Equality	Yes	No
Gender Equality	Yes	No
Human Rights	No	No
Rural Proofing	Yes	No

Annex A: Administration and Pass Through Costs

1 CESP will incur inevitable administration costs through its delivery. The modelling of these costs is carried out in the same way as it was for CERT, by assuming that for each measure delivered there is an associated administrative cost representing both the costs associated with finding households who want and need the measures and also the head office costs of suppliers and generators running the programme and reporting to Ofgem. These indirect administrative costs are very difficult to estimate. For the analysis, indirect costs are assumed to be a percentage of the unit cost of the measure. A fixed percentage tends to give unrealistically high admin costs for expensive measures. Using bands (e.g. 20% if less than £500, 10% if more, etc.) leads to jumps where if a measure was cheaper by a small amount its administration cost would be nearly doubled. To avoid such discontinuities, the following empirical formula was used as the most practical way of assigning values.

$$\% \text{ of unit cost} = 250 / (\text{unit cost} + 1000)$$

2 The percentage is higher for low cost measures (reaching a maximum of 25% for the cheapest), but falls off exponentially as the cost increases. This means that the absolute indirect cost rises at an ever-slower rate as the unit cost increases. This gives an indirect cost of 20% at a unit cost of £250 and 10% at a cost of £1500. Unlike in the analysis for CERT, we do not assume a higher indirect cost associated with a priority group as this principally represents the cost of identifying priority group households and in CESP, priority areas will be pre-defined.

3 Given that the administrative costs increase with the cost of measures but not following a direct scaling, our final community approach has estimated administrative costs of ~ £27m.

4 There are several important aspects to CESP that could increase these administrative costs that need to be highlighted:

- The emphasis within CESP on a whole house approach and intensive action within small geographical areas may mean greater time and effort is spent identifying the areas, and homes within those areas with the most potential for the delivery of measures. This could consequently increase administration costs.
- The high potential liability on the suppliers and generators if they fail to deliver on CESP may increase administration costs due to the steps that will need to be taken to avoid this significant risk
- Overcoming household resistance to disruptive measures such as solid wall insulation will incur further administrative burdens.

5 CESP has been designed to include certain features that should overcome these increased administrative costs. These include:

- The community approach of encouraging suppliers and generators to deliver measures with the assistance of community partners which will allow the community partners to use their local knowledge to reduce the costs associated with identifying households and areas with the most potential. Community partners may also help to overcome householder resistance to measures.

- For suppliers, delivering CERT and CESP measures within the same area will reduce administration costs for each programme. For generators, the ability to refer additional non-CESP measures on to CERT obligated parties may reduce the costs

6 CESP will of course be new, and it is therefore possible that existing programmes do not provide a sufficient guide.

The maximum pass through costs

7 For the purposes of this assessment, we are assuming that all the costs incurred through CESP by the suppliers and generators will be passed onto their customers. This means on this model that individual domestic consumers will experience an increase in bills corresponding to all of the suppliers' costs plus a proportion of the generators' costs. The maximum pass through cost of the programme (which includes 100% of the cost of CESP measures, plus 100% of the administration costs incurred by suppliers and generators to deliver those measures) will be approximately ~£350m + £27m, which comes to ~£377m. However, a proportion of the generators' pass through costs will go to industrial customers and will therefore not be passed onto domestic consumers. It is also assumed, as discussed below, that a proportion of the overall costs (including the administration costs) will be covered by the third parties such as householders or community partners who will be working with the suppliers and generators to deliver the programme. The possibility of combining funding from different schemes has also been discussed, but raises issue of double counting scores.

How the programme will divide administration and measures costs

8 It is unlikely that the total programme cost above will be divided between the suppliers and generators and then passed on to consumers accordingly. This is because we assume that, in some circumstances the community partners may contribute a relatively large proportion of the administration costs and a small proportion of the costs to the measures. This is because there may be enough competition, between third party groups looking to work with suppliers and generators, that those who can contribute to the programme in some significant way will be accepted as partners by the obligated parties. It is also possible that householders themselves, who are able to pay, may contribute directly.

The Community Approach

9 Under the community approach, we assume that suppliers and generators would pay most of the costs of the measures but a smaller proportion of the administrative costs. These variables may change a little with suppliers and generators contributing a larger proportion of the administration costs and a smaller proportion of the cost of the measures, however overall we assume that ~82.5% of the total costs are met by the suppliers and generators. We assume that all the costs borne by suppliers and generators are passed on (~£311m) however only 35% of the generators' costs are passed on to domestic customers as the rest are passed on to other electricity consumers. Overall we estimate the pass through costs to consumers will be approximately £210m⁹

10 During the consultation process, some of the uncertainties around how costs might be passed through have been raised. For the energy suppliers, any pass through could be directly applied to consumers' bills though for the electricity generators who do not have a direct link to household customers, this is more difficult. For generators who are part of vertically integrated companies, it is conceivable that the linked supply business could pick up all the costs for the generation and supply CESP obligations and pass these directly to households. However this

⁹ See Annex B, Impact on Fuel Poverty

would place the company at a disadvantage in the competitive market for domestic energy supply. It is also conceivable that their generation arm could gather and pass through all the costs through an increase in the price of the wholesale electricity it generates. Which approach a vertically integrated company takes will be dependent on the commercial arrangements and decisions of that company and on the competitiveness of the retail and wholesale markets. In practice it is assumed that each arm of a vertically integrated company will manage the costs of the CESP programme separately to the other arm.

11 For companies which are independent of the supply business, the choices are more limited and it seems reasonable to assume that costs passed through will be directly met through a small increase in the wholesale electricity price. With some exceptions, the wholesale electricity market is very dynamic and not governed by long-term fixed price contracts. Where long-term fixed price contracts are in place, the rationale for using these is to provide certainty against the risks of market fluctuations. In effect the risk is transferred from the buyer to the seller with an associated additional cost. Obligations such as CESP (although small) are one of many factors causing fluctuations in the wholesale price electricity price and the risk of such obligations may no doubt be included as a factor in calculating the price of offering the certainty of a long-term fixed price contract.

Annex B: Fuel poverty analysis

Low income households

1 It is difficult to source data on energy consumption by level of income. However, assuming that there is a fairly strong correlation between consumption and bills (a reasonable assumption), considering average spend by income decile should be a close approximation.

2 Low income households tend to spend much less than average income households on fuel. The table below shows the average weekly and annual spend on fuel (electricity, gas, coal & solid fuels and domestic heating oil) by income decile of the reporting household, updated to 2008 prices. The final column shows the spend on energy bills by income decile, relative to average spend.

Spend on electricity, gas and other domestic fuels, by income

Income decile	2006		estimated, 2008	
	per week	per year	per year	relative to average
Lowest	£10.20	£530.40	£675.90	-36%
Second	£12.50	£650.00	£828.30	-21%
Third	£14.00	£728.00	£927.60	-12%
Fourth	£14.00	£728.00	£927.60	-12%
Fifth	£15.40	£800.80	£1020.40	-3%
Sixth	£15.90	£826.80	£1053.50	0%
Seventh	£16.40	£852.80	£1086.70	3%
Eighth	£18.00	£936.00	£1192.70	13%
Ninth	£19.70	£1024.40	£1305.30	24%
Highest	£22.90	£1190.80	£1517.40	44%
Average	£15.90	£826.80	£1053.50	

Source: Expenditure & Food Survey, ONS

Energy efficiency

3 The Standard Assessment Procedure (SAP) is a means of determining the energy efficiency standard of a dwelling. It uses a scale to measure the heating and insulation characteristics of a property, with higher numbers indicating a better energy efficiency standard. Looking at SAP ratings, the average SAP value is very similar across all income deciles, although does tend to drop as income rises. There are more dwellings with SAP > 65 in the lower income deciles (compared with the higher deciles), but the proportion of lower rated dwellings is similar across the income deciles.

Income decile	Ave sap	% of households with	
		SAP < 35	SAP > 65
1	48.8	18%	16%
2	50.8	15%	17%
3	50.6	13%	16%
4	49.2	15%	13%
5	48.8	15%	12%
6	49.4	13%	11%
7	48.6	14%	8%
8	47.6	16%	8%
9	47.1	18%	10%
10	47.0	18%	9%

Impact on fuel poverty

Pass through costs:

Consumers

4 If the total cost of the CESP programme to suppliers and generators is passed on to domestic consumers on bills, but also assuming that only ~ 35% of electricity from the generators is for domestic use and only this 35% is passed on to domestic customers whilst 100% of supplier energy is for domestic use, we estimate the total estimated cost of CESP to be borne by domestic households will be around £210million.

5 As under CERT, we have assumed that suppliers are able to pass costs through entirely to domestic customers rather than spread the costs between domestic and business – they have the ability to do this because they have different pricing structures for domestic and business. Generators however only sell to big business (suppliers and big industry) so it seems reasonable to assume they spread the pass-through over all their customers.

6 The table below shows the impact on bills of passing this cost on to consumers.

Total CESP spending passed on	Increase in bills (average per household)	Estimated increase in fuel poverty (households)
£11.8m	£0.50	neg
£23.6m	£0.90	neg
£35.4m	£1.40	10,000
£47.3m	£1.90	20,000
£59.1m	£2.40	20,000
£78.0m	£3.10	30,000
£94.5m	£3.80	30,000
£118.1m	£4.70	40,000
£141.8m	£5.70	50,000
£177.2m	£7.00	60,000
£236.3m	£9.40	70,000

Note: the increase in bills is measured as an average per household – households that are not connected to the gas network will incur roughly half of the increase illustrated in the table.

7 Under the programme, not all the costs would be transferred to customers in the same year. Assuming the £210 million was split over three years as £70 million per year, the programme could potentially place between 20,000-30,000 households into fuel poverty over these three years.

8 It is worth noting that this approach above assumes that the pass-through costs are passed on equally to every customer account – in practice, it is likely that the costs will be passed on as an increase in unit charges for gas and electricity, and therefore the increase in bills will be proportional to usage. From the earlier table on spend by income decile, this would suggest that the lower income households will face slightly lower increase in charges, and higher income households will face slightly higher increases.

9 While the increase in costs, if passed through to consumers, may shift a certain number of households into fuel poverty, they will become marginally fuel poor. However, average annual fuel bill savings of £328, as estimated under the community approach, would help much more severely fuel poor households out of fuel poverty, or closer to coming out of fuel poverty

Industry/business

10 The total cost passed through to industry and business might be around £100 - £150 million over the programme period. However it is very difficult to make an accurate estimate of the exact pass-through charge, since the cost faced by each will be dependent on their energy consumption. The increase in unit cost is likely to be below 1% (marginal impact on generators prices).

Benefits

11 Energy efficiency measures realised through the CESP programme are estimated to provide fuel bill reductions worth £33 million per year (see below). Although only approximately 90,000 households would benefit, many of those would achieve significant reductions in their bills, even if they are not removed from fuel poverty. Benefits of measures expected to be implemented have been considered and applied to households in the lowest 10% of incomes (around 2.1 million households).

12 It is important to recognise that if a household is not currently fuel poor, it cannot be removed from fuel poverty. Some non fuel poor households will benefit from measures when they are not currently fuel poor. Similarly, some households that are severely fuel poor may not be removed from fuel poverty despite the measures, though removing them from fuel poverty subsequently would be easier. Therefore, assessing the benefits purely on a fuel poverty basis is spurious since all households receiving measures would incur lower fuel bills and reduce CO₂ emissions.

13 An illustrative mix for the measures installed under this approach is given in annex C. Assuming the programme includes a strong incentive for a whole house approach these measures might be delivered to over 90,000 households. Of this, 90,000 households, it is expected about half will receive significant packages, worth an average of £540/year bill savings; it is expected the other half will receive single measures, or smaller packages, worth an average of £115/year bill savings.

Fuel poverty implications

14 The figures used to estimate the impact on fuel poverty come from the 2006 fuel poverty data set, derived from the English House Condition Survey (from the Communities and Local Government department). The estimates have been made by selecting only households in the lowest income decile and assuming that these households are each equally likely to benefit from the measures.

15 The assumed saving per household is also the same for each of these households and has been set in line with the figures derived from the illustrative mix (in Annex B) by dividing the total fuel bill saving by the number of households who benefit under each option. By applying this fuel bill saving to each of the households in the lowest income decile, it is possible to estimate how many of these would be removed from fuel poverty due to the saving, and calculate this as a % of all households in the lowest income decile, thereby giving a probability of households in the lowest income decile being removed from fuel poverty through the savings. By multiplying this probability by the total number of households receiving the measures, we can estimate the number of fuel poor households who are removed from fuel poverty.

16 This analysis estimates that the approach could remove a little more, possibly around 30-40,000.

Annex C: Illustrative Mix of measures for CESP 2009-2012

1 This annex describes the Illustrative Mix of measures for the Community Energy Savings Programme (CESP).

Introduction

2 The programme builds heavily on principles and assumptions used in the Energy Efficiency Commitment (EEC) and Carbon Emissions Reduction Target (CERT) schemes (see for example the CERT consultation and Illustrative Mix http://www.opsi.gov.uk/si/si2008/draft/em/ukdsiem_9780110805306_en.pdf).

3 The illustrative mix table included here gives an idea of the numbers of measures that the programme might deliver. However given the open nature of the list of measures, costs, carbon savings and uplifts within the programme, the illustrative mix should not be seen as a case study of how companies would meet their obligation, but as an example of the approximate scale of the programme and the typical costs and carbon savings for measures included. The illustrative mix tables do not show a prediction or 'government view' of the numbers of measures which will be delivered under the CESP and the aim of the programme is to allow obligated energy companies to meet their obligation in a wide variety of different ways by supporting projects which deliver the right solutions at the local level.

Description of model fundamentals

How savings are calculated

4 Energy, fuel bill and carbon savings have been calculated for a range of domestic carbon saving measures following the same methodology used for the CERT scheme – using the BREDEM model from the Buildings Research Establishment and assuming the measures are installed in a typical 3 bedroom semi-detached house. As with the current CERT programme the carbon savings (and so the carbon scores) for measures delivered under CESP will be calculated by Ofgem, taking into account any further considerations which Ofgem believe are appropriate. Under CERT this includes consideration of the size and type of home into which the measures are installed and in some cases the fuel type that home is using for heating. This is particularly worth noting for CESP as the households which receive measures in CESP may not fit the typical 3 bedroom semi-detached model. The illustrative mix tables provided here and in the consultation document give an approximation of the carbon savings Ofgem might attribute to a measure based on some assumptions and averages of house size and fuel types.

5 Originally the value of energy savings was given at the retail price (in the partial impact assessment published with the CESP consultation). Since then new government guidance on how to value energy savings has come into effect. Now valuing energy reductions is done using the resource cost (variable element cost). Comfort taking is still valued at the retail price.

Scores for measures

6 Measures will be scored according to their lifetime carbon saving, as under EEC and CERT. Scores will be further modified away from the direct carbon savings through uplifts to ensure that the measures which are considered to best deliver the policy objectives are cost effective for suppliers/generators to install.

District Heating

7 District heating has been shown to have the potential to reduce CO₂ emissions from groups of dwellings when counted as a whole¹⁰. District heating can be particularly successful when used in a situation where lots of homes are grouped together, in flats or a tower block for example¹¹. Indeed, there are a number of examples across the country of successful district heating schemes¹².

8 As each district heating scheme would be different, Ofgem will assign a points score to district heating schemes on a case-by-case basis. This score will reflect the CO₂ savings delivered to each domestic home on the network which is in an area eligible for CESP.

9 In addition to connecting new homes to new or existing networks and reducing the carbon intensity of the heat delivered by district heating networks, the installation of individual home heat meters is also a qualifying action. The move from using unmetered heat and paying for this on a flat rate to having a heat meter for a home and paying just for the heat used has been shown to reduce heat demand by up to 20% or 30% however the evidence of the saving from fitting meters tends to be from outside of the UK. The figures used here assume a 10% saving is realised and so are quite conservative. The lifetime of heat meters is assumed to be 15 years as anecdotal evidence suggests this is the approximate battery life of meters and, in some cases, approaching the technical lifetime as well.

Home Energy Advice

10 Home energy advice will now be included in CESP proposal after overwhelming support for its inclusion during the consultation. This was based on energy advice helping to reinforce behavioural changes and strengthen the savings delivered by physical measures. It is proposed home energy advice in CESP will run in much the same way it is proposed to be included in CERT. Home energy advice will receive a (small) carbon points score under CESP, but will be not be eligible for bonuses or uplifts and will not provide bonuses or uplifts to other measures.

11 Further evidence for the savings delivered by home energy advice can be found in the CERT documents.

Uplifts for measures

12 Cavity wall and loft insulation receive a score reduction (in effect scoring half as many carbon points as their lifetime CO₂ savings would suggest). The rationale for this is that the CERT programme is the main policy driving cavity wall and loft insulation and this should remain the case without competition between the CESP and CERT programmes. We envisage cavity wall and loft insulation continuing to be delivered primarily under the CERT programme but the measures are included here as they may be needed in some homes in target areas as part of a whole house approach.

¹⁰ <http://www.energysavingtrust.org.uk/uploads/documents/housingbuildings/CE65%20-%20Case%20Study%20-%20Hard%20to%20Treat.pdf>

¹¹ www.energysavingtrust.org.uk/power-in-numbers

¹² <http://server-uk.imrworldwide.com/cgi-bin/b?cg=deccce65&ci=energyst&tu=http://www.energysavingtrust.org.uk/business/content/download/179174/421895/version/1/file/ce65.pdf>

13 Significant uplifts have been applied to solid wall insulation measures as these measures are not well supported by other programmes and can make a significant difference to the fuel bills and emissions of a house. The uplifts we propose are aiming to make solid wall insulation a cost effective measure for delivery within CESP and to ensure that predominantly solid wall areas are strongly considered for delivery of CESP. In addition smaller uplifts have been applied to key heating measures to promote the delivery of packages of measures including both insulation and heating. The new proposed uplifts are described below.

Measure	Score modification
Cavity wall insulation	-50%
Loft insulation	-50%
Solid wall insulation	+200%
District heating	+50%
Biomass boilers	+50%
Heat pumps	+50%
Solar water heating	+50%
Micro-CHP	+50%
Replacement Boilers	+50%

Uplifts for whole house and area based approaches

14 To incentivise a whole house approach, uplifts will be added to the scores for all measures delivered after the first measure in a home. The size of the whole-house bonus percentage is dependent on which measures are installed. Each measure contributes a different amount to whole-house bonus percentage and the overall whole-house bonuses is the addition of the bonuses by all the measures installed.

15 For example, assuming three measures are available with scores and uplift contributions, as set out in the table below.

Measure	Score	Bonus
Measure 1	20	+50%
Measure 2	10	+10%
Measure 3	10	+50%

For the first measure installed, total score = 20 points

For the second measure installed, total score = 30 points (+60%) = 48 points

For the third measure installed, total score = 40 points (+110%) = 84 points

The bonuses provided for delivering more than one measure per household are given in the table below.

Measure	Contribution to whole house bonus
Cavity wall insulation	10%
Loft insulation	10%
SWI external	50%
SWI internal	50%
Fuel Switching	40%
District heating individual meters	10%
Heating controls	10%
District heating	40%
Wood pellet boilers	40%
Solar Water Heater	10%
Air source heat pump	50%
Ground source heat pumps	50%
Micro Wind	10%
Mini-wind	10%
Micro Hydro	10%
Photovoltaic panels	10%
mCHP	10%
Replacing old boiler (65% by 88.3%)	40%
Under floor insulation	10%
Flat roof insulation (whole house)	10%
Draught proofing	10%
Double glazing	10%

16 To incentivise the delivery of intensive action in target areas, delivery to a high percentage of the homes within an area will make all measures delivered in that area eligible for a further bonus. This bonus is calculated after any other bonuses and is cumulative (multiplicative) with them. The size of the bonus is equal to half of the percentage coverage delivered so for example delivering to 40% of homes in an area would result in the measures in those 40% of homes being eligible for a 20% score increase. To avoid providing an uplift at very low levels of delivery, this uplift is only unlocked when a company delivers to more than 25% of homes in an area.

An example of how the scoring may work in practice

17 A Victorian terraced house in Doncaster within a targeted deprived area could be an ideal candidate for the delivery of the CESP programme. It currently has solid stone and brick walls, no loft insulation and a G rated efficient boiler from the 1980's. This house will be losing large amounts of energy through heat escaping through the roof and walls. The boiler is very inefficient and will be burning a lot of fuel for the heat it produces.

18 A whole house approach to improving this home might be to install loft insulation to current building regulation standards, provide internal solid wall insulation and replace the old boiler with an efficient condensing model. The points score available for these improvements would work as follows:

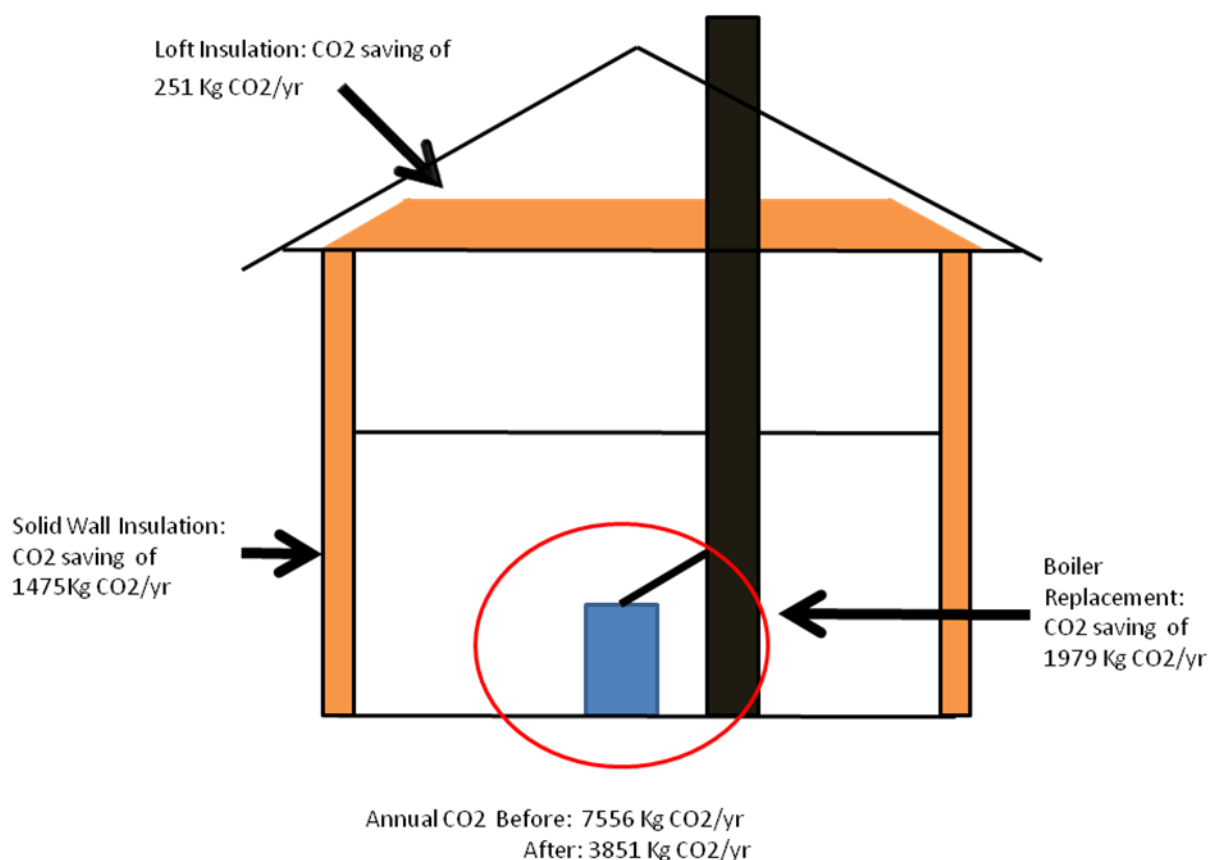
19 Installing loft insulation would cost approximately £268, the carbon dioxide savings would be roughly 251kg CO₂, the points score of this measure as set out in the illustrative mix would be 5.0

20 Installing internal solid wall insulation would cost approximately £3,500, the carbon dioxide savings would be roughly 1,475kg CO₂, the points score of this measure as set out in the illustrative mix would be 132.8.

21 Installing a new boiler would cost approximately £2500, the carbon dioxide savings would be roughly 1979kg CO₂, the points score for this measure as set out in the illustrative mix would be also be 29.0.

22 The total cost for introducing loft insulation, internal solid wall insulation and a replacement boiler would be approximately £8,000. The total carbon dioxide savings these measures would represent in this case would be roughly 3,700kg CO₂¹³. The total points score for measures installed within this house would be 216.8 however as three measures have been installed in the same house, these measures would eligible for a whole-house uplift. The size of the uplift is given by the addition of the contributions from each measure installed. These are loft insulation 10%, ISWI 50% and new boiler 40%. This gives a whole house uplift of 100% and a total score of 438.

23 Diagram to show the CO₂ savings that could result from a whole house approach as described above: [figures for picture will need to change]



¹³ Note that the savings from insulation and heating measures are generally not completely additive however for the purposes of this CESP scoring system, savings from multiple measures in a single dwelling are assumed to be additive. A correction is then applied at the whole policy level to reduce the calculated savings achieved by the policy to the correct level.

Capping

24 To mitigate the risk of an obligated company finding alternative method of delivery which does not meet the overall objectives of the programme three measures will be capped and so will not score if delivered beyond their cap. These caps are assessed in percentage carbon score terms. A cap at 1% would mean that a company could meet up to 1% of its obligation through the delivery of that measure – based on adding up the carbon scores for each individual example of that measure delivered prior to applying any bonus scores or reductions (uplifts) that apply to the carbon score of that measure. If the cap on a measure is exceeded then any further delivery of that measure will not score a carbon saving, nor count for the calculation of bonuses to other measures.

25 The proposed caps are as follows:

Home Energy Advice – 1%

Cavity Wall Insulation – 4%

Loft Insulation – 4%

26 It is difficult to say in precise terms what these caps equate to as numbers of measures delivered given that the scores achieved by measures depends on the property type in which it is delivered. However in approximate terms this equates to ~285,000 home energy advice, 45,000 cavity wall insulations and 250,000 loft insulations.

How CESP may operate on the ground

27 There are numerous groups and partnerships working to address fuel poverty and /or climate change through energy efficiency measures across the country. Many will be working with their local authority and be a part of the Local Strategic Partnership (see above). In some areas there will be partnership work actively considering local energy planning. Suppliers are also often involved in local delivery partnerships as part of their existing obligation.

28 We assume that a generator/supplier will consider whether its existing partnerships work in appropriate qualifying areas, or whether they need to work in what will be new areas for them in which case they will need to engage with relevant partnerships and community groups relating to that area. In partnership they will agree their approach, paying due consideration to any existing approaches to delivery.

29 It is likely that this will include contacting householders within the area to carry out an assessment of which energy efficiency measures could be suitably delivered within each home will be made.

30 Due to the points score uplifts associated with installing more than one measure within each home it is expected that the generators/suppliers will prefer to install as many complementary and appropriate measures per home as possible.

31 The generators/suppliers, in partnership with the community groups, will then encourage the householder to agree to the installation of as many measures that are available under CESP that are appropriate for each individual home. Once an agreement has been made with every home a calculation can be made on the estimated score available for that area. This calculation assessment will then be sent to Ofgem to confirm the proposed action will be eligible for CESP scoring.

32 Generators/suppliers in partnership with community groups will then coordinate with installers a strategic approach to delivering measures. We envisage the most cost effective delivery will have installers of a particular measure working on a house by house basis within the specified area.

33 We envisage that CESP will be delivered in a way that meets its objectives as a result of the:

- measures available under CESP all delivering significant CO₂ and fuel bill savings
- points score uplifts associated with installing many complementary measures within a single home
- cost efficiencies of taking a strategic 'every house contacted' approach to designing and delivering an installation programme
- partnerships established with community groups

Costs

34 The cost of measures to suppliers and generators is estimated by considering the direct cost of measures, the indirect costs (administration, marketing, search costs) and any contribution by the householder or a third party. The assumed cost split between obligated parties and community groups, landlords and householders across the whole programme is set out in Annex A.

35 The costs of measures given in the tables are designed to be appropriate considering the assumptions and averages used to generate the carbon savings. For example if the carbon savings in the tables represent the measure being installed in a large property, the cost should also reflect this. However the costs do assume that measures are being delivered in bulk and in some cases only partially include some of the associated costs where it seems likely that these could be met through another route. The costs also do not reflect the average cost of a measure installed anywhere in the country, but reflect the costs which might be paid within the programme. Since the energy companies are likely to try to meet their obligation at least cost, by finding synergies and low cost approaches or lower cost homes, the cost of measures in the table reflects the savings these approaches might bring.

36 The costs of measures have been revised in light of comments made and evidence provided during the consultation period. The most significant changes have been in the cost estimates for solid wall insulation (SWI). The evidence shows that the cost of solid wall insulation can vary widely between property types and between properties of the same type, due to problems with access or making good the underlying structure prior to installing the insulation. In addition it is clear that when seeking out individual homes to receive SWI it may be appropriate to assume the associated costs such as the cost of scaffolding can be met by the householder or landlord – for example when other work is going on at the same time. However taking a street-by-street approach this assumption is no longer valid as it is unlikely that all homes will be undergoing renovations at the same time. The costs for external solid wall insulation therefore now include an element of associated costs. The cost figures are taken from a variety of sources however a key piece of the evidence base is a review of the insulation supply chain carried out by Purple Market Research.¹⁴

Number of Installations

37 The number of each measure installed within the programme is estimated based on prior experience with the EEC and CERT schemes, the likely cost effectiveness of measures to

¹⁴ <http://www.eeph.org.uk/uploads/documents/partnership/SWI%20supply%20chain%20review%208%20May%2020091.pdf>

suppliers/generators and the proposed criteria for scoring and uplifts. This includes the proposed caps discussed previously for Home Energy Advice, Cavity Wall Insulation and Loft Insulation.

Supply chain issues

38 Given the small number of measures expected to be installed through CESP (in comparison to ECC and CERT) there are not considered to be any constraints brought about by a limited supply of measures or installers..

Types of houses and potential to deliver

39 Having target areas which include approximately 10% of the GB housing stock will provide a large pool of possible homes for suppliers and generators to target (~2.5 million homes). The number of households which are suitable for both a menu 1 and menu 2 measure is however a significantly smaller number.

40 For insulation, data suggests that approximately 36% of the target households have solid walls almost all of which can be insulated (either internally or externally) and do not currently have solid wall insulation. Also 34% of target households have cavity walls which are currently un-insulated. In addition over the target group 11% have 50mm or less loft insulation.

41 For heating measures the data is sparser however approximately 15% are not currently gas heated and are likely to be suitable for either fuel switching or a heat pump. The potential for community heating schemes is very large although they make up a very small part of the illustrative mix due to the difficulties of delivering community heating solutions within the timeframe of CESP. G-rated gas boilers make up approximately 15-20% of the domestic gas boiler stock. Assuming they are represented proportionally in the target areas this represents a significant potential. And finally while micro-gen may not be a cost effective solution for many homes, it is expected to make up a small part of the delivered programme.

42 Given the physical nature of the housing stock and the potential remaining for delivering the key measures in CESP, there does not appear to be a limitation on the ability of the programme to meet the overall CO₂ reduction target through delivery of measures similar to that set out in the Illustrative Mix.

Carbon savings and comfort taking

43 Households who have their fuel bills reduced due to measures installed may wish to use some of the saving to fund increasing the temperature of their homes as their thermal comfort. We assume comfort taking reduces the emissions savings by 40% for all insulation measures installed in low income areas (15% is assumed in CERT and for any CESP measures installed outside of low income areas, however given the CESP focus on low-income areas a larger figure seems appropriate in these areas). Research suggests that after a home has reached a comfortable temperature of approximately 21°C in the living area further bill savings will not be taken as increased comfort. To account for this, when considering the CESP whole house approach, comfort taking has only been applied to insulation measures¹⁵.

¹⁵ References to research on comfort taking in similar circumstances:

Hong, S. H. et al, The Impact of energy efficient refurbishment on the space heating fuel consumption in English dwellings; Energy and Buildings 38 (2006) 1171-1181.

www.apfo.org.uk/resource/view.aspx?RID=53281

<http://www.eci.ox.ac.uk/research/energy/downloads/40house/chapter04.pdf>

<http://www.defra.gov.uk/environment/climatechange/uk/energy/research/pdf/insulationmeasures-review.pdf>

44 Fuel bill savings are presented here without a reduction from comfort taking as the value of the additional thermal comfort is equal to the cost of paying for the extra demand (if households did not believe comfort taking was worth it they would not do it).

45 Adding up the expected carbon savings from all the individual measures that might be installed under CESP from the Illustrative Mix table gives an overall lifetime carbon saving of 3.84 MtCO₂. This figure of 3.84 MtCO₂ is different to the programme carbon savings as quoted elsewhere in this document. There are two key reasons for this. Firstly this figure of 3.84 MtCO₂ does not account for heating and insulation measures installed in the same home not giving 100% additional savings (as compared to installing the same two measures in two different homes). Since a whole house approach is a key part of CESP, the real savings delivered by the programme will be smaller than 3.84 MtCO₂. The actual size of the reduction is very dependent on which measures are installed with which other measures but we have assumed an 80% reduction. Secondly some of the measures installed save electricity and are long lived and so for the purposes of calculating the overall savings from the programme future grid decarbonisation is considered. However neither of these factors effect the way savings are calculated in the illustrative mix, or how these savings are affected by bonuses and add up to the overall notional target of 19.25 MtCO₂.

Illustrative Mix

Carbon saving measure	Number of measures	Cost of the individual measure	Cost to the obligated company	Individual lifetime kgCO ₂ saving (after comfort taking)	Lifetime of CO ₂ savings	Individual lifetime tCO ₂ savings (after measures uplifts)	Annual bill savings (£)	Uplift on measure (score multiplied by this percentage)	Carbon score	Cost effectiveness if delivered as a single measure (kg CO ₂ score per £ spent)
Cavity wall insulation	10,000	356	364	448	40	17.9	127	50%	9.0	28
Loft insulation (prof virgin)	8,000	268	276	251	40	10.1	72	50%	5.0	21
Loft insulation (prof top-up)	40,000	268	276	87	40	3.5	25	50%	1.7	7
SWI external (flat)	14,000	3,600	3369	820	30	24.6	234	300%	73.8	23
SWI external (semi-det house)	13,000	6,300	5812	1,560	30	46.8	445	300%	140.4	25
SWI internal to U of 0.45W/m ² K	15,000	3,500	3278	1,475	30	44.3	420	300%	132.8	42
Fuel Switching	5,000	3,888	3630	4,220	20	84.4	694	100%	84.4	24
Heating controls - upgrade with new heat system	20,500	84	89	35	12	0.4	6	100%	0.4	6
Community heating meters	10,000	200	208	431	15	6.5	100	100%	6.5	36
Existing community heat to CHP	10,000	701	418	685	30	20.6	64	150%	30.8	88
Electric to community CHP	5,000	7,124	3707	3,107	30	93.2	914	150%	139.8	39
Wood pellet boilers (primary)	0	7,110	6544	5,192	20	103.8	330	150%	155.8	24
Solar Water Heater (4m ²)	700	3,500	3278	326	25	8.1	57	150%	12.2	4
Air source heat pump	5,000	5,844	5400	3,076	15	46.1	443	150%	69.2	13
Ground source heat pumps	1,000	10,295	9416	2,204	40	88.2	474	150%	132.2	14
Micro Wind (1 kWp, 1% LF)	0	3,200	3006	38	10	0.4	105	100%	0.4	0
Mini-wind 5 kW, 20% LF	0	21,000	19058	3,777	22.5	85.0	1066	100%	85.0	4
Micro Hydro (0.7kWp, 50% LF)	0	1,890	1809	1,322	20	26.4	368	100%	26.4	16
Photovoltaic panels (2.5 kWp)	50	9,375	8587	911	25	22.8	254	100%	22.8	3
mCHP (revised)	50	563	566	210	15	3.2	128	150%	4.7	9
Replacing old boiler (65% by 88.3%)	13,500	2,500	2368	1,610	12	19.3	253	150%	29.0	13
HEA	100,000	45	48	90	7.5	0.7	17	100%	0.7	17
Underfloor insulation	1,000	800	793	217	10	2.2	50	100%	2.2	3
Glazing E to C rated	1,000	200	208	71	20	1.4	16	100%	1.4	8
Flat roof insulation (whole house)	500	1,500	1449	87	40	3.5	25	100%	3.5	3
Draughtproofing (ie not with glazing)	1,000	100		101	10	1.0	29	100%	1.0	11

All forms of community heating will be eligible, and will be assessed on a case-by-case basis for their carbon saving and score. Supplier / generator cost is assumed to be 90% of the direct cost of the measures and 50% of the admin cost in most cases (see annex A). For district heating, suppliers and generators are assumed to meet 50% of the capital costs of schemes with the remaining 50% being recovered through heat sales through the life of the district heat network.

Comfort taking is assumed at 40% for insulation measures only. Air source heat pumps are assumed to be installed in electrically heated dwellings only.

The Illustrative Mix divided into packages of measures

46 Whilst the table above shows a number of each measures which might be delivered to meet the overall target, and by adding up the cost of each measure it is clear that this table delivers £350m worth of measures, it is not clear from this table how the delivery of these measures would meet the overall 19.25 MtCO₂ score target. To demonstrate that the delivery of these measures would meet the target it is necessary to make assumptions about the levels of whole house uplift and area based uplift that would be gained by companies. The table below sets out the same measures delivered but separated into packages where each package represents the delivery to a single household. Adding up the scores of the packages in the table below gives an overall score of 14.54MtCO₂ carbon points. In addition to delivery in packages, measures will also be delivered through intensive action in target areas. Assuming, on average over the scores of all the projects delivered, a coverage of 65%¹⁶ is achieved. This would provide a 32.5% bonus to the overall score, leading to just in excess of 19.25MtCO₂ points score obtained.

¹⁶ A variety of previous community projects suggest that this level of coverage is achievable when significant effort is made to engage with the local community. For example in the Hadyard Hill Community Energy Programme (<http://www.energyagency.org.uk/projects.php>) and the Changing Streets programme (<http://www.eastriding.gov.uk/cs/housing-and-public-protection/housing-services/private-sector-housing/>).

Package	Carbon score for package (tonnes)	Whole-house uplift	Score after uplift (tonnes)	Number delivered	Total Score (kilo-tonnes)
ESWI (flat) + ASHP + HC	143	110%	301	4000	1205
ESWI (semi) +ASHP + LI top-up	211	110%	444	1000	444
ESWI (semi) + Boiler + LI top-up + HC	172	110%	360	5000	1801
ISWI + Boiler + LI top-up + HC	164	110%	344	5000	1721
ESWI (semi) + fuel switch + LI top-up + HC	227	110%	477	2000	953
ISWI + fuel switch + LI top-up	219	100%	438	2000	876
CWI + fuel switch + LI top-up	95	60%	152	1000	152
ESWI (flat) + DH + HM	111	100%	222	10000	2222
ISWI + DH + LI top-up	274	100%	549	5000	2743
ESWI (semi) + LI top-up	142	60%	227	2000	455
ISWI + LI top-up	135	60%	215	3000	646
ESWI (semi) + GSHP + LI top-up + HC	275	120%	605	1000	605
CWI + Boiler + LI top-up + HC	40	70%	68	3000	204
CWI + LI top-up	11	20%	13	5000	64
CWI	9		9	1000	9
ESWI (semi)	140		140	2000	281
LI (full)	5		5	8000	40
LI (top-up)	2		2	5000	9
SWH	12		12	700	9
Photovoltaic panels (2.5 kWp)	23		23	50	1
mCHP (revised)	5		5	50	0
Boiler + HC	29	50%	44	500	22
Home energy advice	1		1	100000	68
Underfloor insulation	2		2	1000	2
Glazing E to C rated	1		1	1000	1
Flat roof insulation (whole house)	3		3	500	2
Draught proofing (not with glazing)	1		1	1000	1
Total					14.54MtCO2

Annex D: Key Assumptions/Sensitivities/Risks

How to value carbon savings

1 The carbon savings are calculated by taking the annual savings in tonnes of carbon dioxide equivalent and multiplying it by the correct price. This is then broken down into tonnes saved under the traded sector and the tonnes saved under the non-traded sector. The non-traded savings are multiplied by the SPC (shadow price of carbon). The SPC is the cost to society of the damage caused by carbon emitted. The price in 2009 for the SPC is £27 and increases by 2% every year. In the traded sector, under the EU ETS, the price is set by EU allowances. These are essentially the revealed price that firms are willing to pay to emit an extra tonne of carbon. The 2009 price is £16.72 and increases up to 2012 by three percent. After 2012 the EU allowances' price increases further.

2 The issue of poorly predicted the costs of measures is a small factor as suppliers and generators have the flexibility to follow a least cost solution. This does however mean that the carbon savings set out in this impact assessment are based on an illustrative mix which is only one possible solution for suppliers and generators to meet their targets. If suppliers and generators find a lower cost method of fulfilling their obligation they are likely to take it and this may mean the numbers of measures delivered on the ground are not similar to the illustrative mix. In this case the carbon savings may be quite different while the costs for suppliers and generators are slightly reduced.

3 If the estimated costings for measures are inaccurate, this will impact on the number delivered and therefore the overall carbon savings. For example, if the scheme were disproportionately deliver solid wall insulation there would be virtually no change in the carbon saved. However, if there were to be a disproportionate number of replacement boilers, the overall carbon saving would be greatly reduced. Realistically, it is possible that the real carbon savings may vary by -20% to +100%.

Annex E: Carbon Impact Assessment

1 The carbon impact assessment has looked at potential reductions or increases of carbon from the different approaches. All carbon emissions reductions are considered at a whole programme level and are converted from kgCO₂e into monetary terms for inclusion in the cost-benefit analysis of the options. There are two different factors for converting emissions reductions into monetary values, the Shadow Price of Carbon (SPC) and the value of EU ETS allowances.

2 The EU Emissions Trading Scheme places an EU level cap on emissions from sources covered by the scheme. (For the purposes of this policy assessment the only sources of relevance are UK electricity producing power stations.) Allowances to emit carbon are issued to member countries. The UK **net** emissions within the scheme are fixed by the number of allowances issued to the UK. Allowances can be traded within the scheme; however emissions savings in one country cause allowances to be sold to other countries. This allows countries purchasing allowances to produce more emissions. In this way any emissions savings from sources within the EU ETS do not cause an EU wide reduction in emissions. However these savings are still valuable to the UK economy as the sale of allowances brings money into the country, and so emissions savings which occur at sources within the EU ETS are valued at the projected price of allowances. For the CESP this relates to any savings of electricity as electricity producing power stations fall within the scheme.

3 The Shadow Price of Carbon is used to value emissions savings which fall outside the EU ETS and so are not traded within the scheme. Put simply, the SPC reflects the damage costs of climate change caused by each additional tonne of greenhouse gas emitted – converted into carbon dioxide equivalent (CO₂e) for ease of comparison.

4 The carbon impact assessment has looked at potential carbon reductions or increases from the different approaches.

5 The Shadow Price of Carbon (SPC) is applied to the emissions that fall under the non-traded sector; the traded price is applied to the emissions that fall under the traded sector. In accordance with government guidance, the valuation of the decrease in emissions that will result from products using less power is calculated using the projected EU Allowance price under the EU Emissions Trading Scheme, i.e. the revenue gained from selling permits for emissions.

6

The values for the EU Allowance used for the period 2008 to 2020 are as follows:

EU allowance under emission trading													
£/tCO ₂	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
2008 Prices	16.0	£16.7 2	£17.2 1	£17.7 3	£18.3 8	£26.6 0	£27.2 7	£27.9 5	£28.6 5	£29.3 6	£30.1 0	£30.8 5	£31.6 2

Assumptions: All prices expressed in £2009, Exchange rate of €1 = £0.7, 2010 -2012 uses prices from the forward market (averaged across August 2007-May 2008), and 2013-2020 is based upon the European Commission's price forecast of €39 (2005 prices) from their Impact Assessment for measures to meet the Climate and Energy Package, adjusted to 2008 prices.

The traded sector price is currently under review. After 2020 a linear function is applied to the 2020 price of 4.5% per annum. This is the cost of carry of the EU allowances price. This is

unlikely to hold; however as there is a risk that the market does not exist or that significant change is not properly factored in, the price schedule is likely to change.

8 CESP produces total lifetime carbon savings amounting to 2.9 Mt CO₂, valued at £63 million. This can be broken down to show £35 million in the traded sector and £28 million in the non-traded sector¹⁷.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Reduction in CO ₂ e emissions (traded) (kT)	68.21	68.21	68.21	68.21	68.21	68.21	68.21	67.53	66.84	66.84
Reduction in CO ₂ e emissions (non-traded) (kT)	50.89	50.28	50.28	50.28	50.28	50.28	50.28	47.51	44.74	44.74

2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
66.79	66.79	66.79	66.79	65.24	53.05	53.05	46.74	45.47	44.21
44.52	44.52	39.72	39.72	39.72	39.73	39.73	39.73	39.73	39.73

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
37.69	37.69	36.58	35.47	34.36	33.20	32.10	30.99	30.99	29.88
27.30	27.30	27.30	27.30	27.30	27.14	27.14	27.14	27.14	27.14

2039	2040	2041	2042	2043	2044	2045	2046	2047	2048
1.04	1.00	0.96	0.92	0.88	0.84	0.84	0.80	0.76	-0.72
8.64	8.64	8.64	8.64	8.64	8.64	8.64	8.64	8.64	8.64

Budget Period	Traded Emissions (kt)	Non-traded Emissions (kt)
2009-2012	272.85	201.73
2013-2017	339.00	243.08
2018-2022	333.99	213.22
2023-2027	263.55	198.66
2028-2032	191.63	148.95
2033-2037	161.64	135.88
2038-2042	33.82	61.72
2043-2047	4.14	43.22
2048-2053	0.72	8.64

¹⁷ The ratio of traded to non-traded sector emissions savings is highly dependent on the measures installed. This is particularly evident when considering the savings from the fuel switching measure which moves a household from using electricity (traded) to using gas (non-traded).

Annex F

Note to summary tables

- 1 Most of the data in the summary tables is explained in more detail in the main document and annexes however, for clarity, some additional explanation is given here.
- 2 The one-off transition costs quoted are our estimates of costs to Ofgem. There will clearly also be set-up costs for the energy company participants in the scheme. In this Impact Assessment we provide our best estimate of the overall administration costs of implementing the scheme over its lifetime, but have not attempted to break these administration costs down into one-off and ongoing elements, as we have insufficient evidence to do so.
- 3 The annual costs are given over three years, as an indicative lifetime period for the CESP programme.
- 4 The annual benefits are based on the expected lifetime of the measures installed. The mix of measures that will be installed includes measures with a lifetime of up to 40 years. Lifetime carbon savings refer to the sum of the carbon savings expected of each measure throughout the lifetime of that measure.
- 5 A standard discount rate of 3.5% pa. is used where applicable however the rate is reduced to 3.0% pa. after 30 years (in line with Treasury guidelines).