EXPLANATORY MEMORANDUM TO

THE ELECTRICITY AND GAS (CARBON EMISSIONS REDUCTION) (AMENDMENT) ORDER 2009

2009 No. [XXXX]

1. This explanatory memorandum has been prepared by the Department of Energy and Climate Change and is laid before Parliament by Command of Her Majesty.

This memorandum contains information for the Joint Committee on Statutory Instruments.

2. Purpose of the instrument

2.1 This explanatory memorandum has been prepared for the Electricity and Gas (Carbon Emissions Reduction) (Amendment) Order 2009 which amends the existing Electricity and Gas (Carbon Emissions Reduction) Order 2008 (SI 2008/188). The Order obligates gas and electricity suppliers who have more than 50,000 domestic customers to meet household carbon emissions reduction targets. Suppliers achieve these targets by promoting (e.g. through subsidised offers) low carbon and energy efficiency measures such as cavity wall insulation and high efficiency light bulbs to households. At least 40% of the carbon saving obligation has to be achieved in a priority group of low income, vulnerable and elderly households.

2.2 This amending Order looks to enact, in light of consultation responses, the Prime Minister's Home Energy Saving Programme announcement of 11th September 2008 which proposed a 20% increase in the Carbon Emissions Reduction Target. The main aim of this proposal was to increase the amount of help householders received to take up energy efficiency measures at a time of high energy prices, to help them save money, save energy and save carbon. In turn this will help the UK Government contribute to tackling climate change, to the security of energy supply and to fuel poverty alleviation ambitions.

3. Matters of special interest to the Joint Committee on Statutory Instruments

3.1 The Secretary of State wrote to suppliers last autumn to confirm the details of the Prime Minister's proposed CERT amendments to enable and encourage them to start taking early action, with confidence of a minimum carbon score for measures, to apply until the final Order was in place following consultation. Several of these proposed incentives, specifically on providing carbon saving uplifts for professionally installed loft insulation and for DIY loft insulation, will not now be enforced. However, suppliers acted in good faith on the scores proposed and the draft Order references 'loft insulation plus' as eligible for the uplifted carbon score between the time of the Prime Minister's announcement and the time the amendment Order comes into force. The reasons why we proposed these amendments in the first place and the reasons they are no longer pursued are set out in detail in the Government's response to the consultation. In summary, they were found to present greater risks than benefits to the carbon and energy saving objectives of the scheme.

4. Legislative Context

4.1 The Electricity Act 1989 and the Gas Act 1986, as amended by the Utilities Act 2000, the Climate Change and Sustainable Energy Act 2006 and the Climate Change Act 2008 contain powers for the Secretary of State, by Order, to impose an obligation on electricity and gas suppliers to achieve carbon emissions reduction targets. This supplier obligation, known as the Carbon Emissions Reduction Target (CERT), applies in England, Scotland and Wales. CERT commenced on 1st April 2008 and concludes on 31st March 2011. It is the third three-year cycle of the household energy supplier obligation, formally known as the Energy Efficiency Commitment.

4.2 The amending Order does not propose to change the aims and objectives of the existing Electricity and Gas (Carbon Emissions Reduction) Order 2008, but rather the ambition. Therefore, the existing Order (www.opsi.gov.uk/si/sis05-02), together with the associated explanatory memorandum and impact assessment published on 5th February 2008, stand as an assessment of the rationale for and detailed workings of CERT.

5. Territorial Extent and Application

5.1 This instrument applies to Great Britain.

6. European Convention on Human Rights

The Minister of Energy and Climate Change has made the following statement regarding Human Rights:

In my view the provisions of the Electricity and Gas (Carbon Emissions Reduction) (Amendment) Order 2009 are compatible with the Convention rights.

7. Policy background

- ***What is being done and why***

7.1 The purpose of the Carbon Emissions Reduction Target is to drive a reduction in household carbon emissions. It does this by setting energy suppliers a carbon emissions reduction target. Suppliers meet this target by promoting the uptake of low carbon energy solutions (whether energy efficiency measures or micro-generation sources of energy) to household energy consumers, thereby assisting them to reduce the carbon footprint of their homes. In taking up these measures, households will enjoy reduced fuel costs and/or enjoy greater levels of thermal comfort. There are numerous policy barriers to consumers taking up these measures directly, which this policy aims to overcome, including information barriers, apathy and up-front costs.

7.2 The primary aim of CERT is to make a contribution to the UK's legally binding target under the Kyoto protocol (to cut greenhouse gas emissions by 12.5% below 1990 levels by 2008-2012) and the Climate Change Act 2008 requirement (to cut emissions of green house gas emissions by 80% below 1990 levels by 2050). CERT, with the 20% increase proposed in the amending Order, will make a significant contribution. It will require energy suppliers to deliver overall lifetime carbon dioxide savings of 185 $MtCO_2$ – equivalent to annual net savings of 5.6

$MtCO_2$ by 2011. It is estimated to require about £3.2 billion in investment by energy suppliers in promoting low carbon measures. The obligation requires 40% of savings in a priority group of low income and elderly households to help ensure an equitable distribution of benefits. To this end CERT is expected to contribute to the alleviation of fuel poverty, with around 60% of supplier investment expected to be directed at the priority group.

7.3 Stimulating growth in green technologies and social innovation is critical to the drive to a low carbon economy and CERT has a role in market transformation and in encouraging activity by suppliers to promote innovative measures or approaches. As an incentive to the promotion of those measures, CERT attributes an additional 50% in carbon savings. In order to limit any potential loss of carbon savings the uplift is attributable within a ring fenced percentage of their total target. This is currently 6% (with 2% additional for micro generation) and is proposed in the amended Order to be increased to 10% (retaining the 2% headroom for micro generation).

7.4 In overview, the amending Order looks to increase the scale of the lifetime carbon saving obligation placed on energy suppliers from 154 million tonnes to 185 million tonnes; to introduce other smaller amendments to encourage energy suppliers to promote a range of more innovative measures such as solid wall insulation and micro generation, as well as those which impact the energy using behaviour of electricity and gas customers (i.e. real time displays and home energy advice); and to remove direct mail high efficiency light bulbs (CFLs) as qualifying measures from 1st January 2010 given the very large numbers already credited to CERT (i.e. approximately 200 million).

7.5 The estimated annual energy savings to consumers, after subtracting comfort taking, would reach a total of around £1.175 billion in 2012, an increase of £193 million as compared to the base case (as now analysed).

- ***Consolidation***

7.6 The amendment Order directly feeds into the existing order and so a one order text will result when it comes into force. The associated impact assessment considers the total costs and benefits of the scheme following the amendments, as well as of the amendments themselves.

8. Consultation outcome

8.1 A consultation on proposed CERT amendments closed on 14th April generating 125 responses from groups including energy suppliers, local authorities, the energy efficiency industry, consumer groups, Ofgem (the scheme administrator) and Scottish and Welsh offices. The policy provisions in the amending Order take account of comments received through the consultation process. They also take account of the latest information on the costs of delivering carbon saving measures and other parameters that are likely to influence capacity constraints and suppliers' costs in meeting their CERT obligations, including levels of consumer demand. A detailed summary of responses and a Government response is published on the DECC website[1].

[1] http://decc.gov.uk/

8.2 There was broad support from stakeholders in consultation responses for the central proposals and the final Order will enforce these to increase CERT by 20% to stimulate significant additional energy efficiency activity; and the market transformation ring fence from 6% to 10% to further encourage innovative measures like solid wall insulation, microgeneration, high efficiency appliances and real time displays.

8.3 The CERT amendment consultation proposed action to curtail direct mail CFLs (energy efficient light bulbs). Only a third of respondents addressed this issue but of those, there was broad stakeholder support. Therefore, we propose to remove direct mail CFLs as qualifying measures from CERT from 1st January 2010 to allow CERT to be more consistent with the voluntary and mandatory (under the Energy-using Products Directive, regulation 244/2009) phase out of incandescent bulbs from sale. It is also in recognition of the high number of unsolicited bulbs distributed early in CERT, some of which risk not being installed - around 200 million CFLs are creditable to CERT to date.

8.4 Stakeholders offered strong comments both for and against the inclusion of behavioural measures (real time displays and home energy advice) with an upfront carbon score in CERT; but all recognised their potential for empowering householders to take action and to help realise carbon and energy savings. We therefore propose to include behavioural measures but tightly capped at 2% of a supplier's carbon saving target to overcome stakeholder concerns that they could otherwise impact on the promotion of other energy saving measures such as insulation.

8.5 A high percentage of respondees could not offer a judgement on the consultation proposals to use carbon score uplifts to promote professional loft insulation, although most indicated that an increase in insulation promotion would be positive. Energy suppliers indicated that they had not, and would not, change their loft insulation offers with the incentives on offer. The insulation industry (who in principle should have benefited), were strongly opposed, asserting that the uplifts would lead to fewer not more installations. We have decided to withdraw these proposed amendments on the understanding that the 20% increase to CERT should do more than the incentives proposed to drive additional investment.

8.6 More than 80% of stakeholders strongly rejected the consultation proposal of uplifting the carbon score for DIY loft insulation (sold by suppliers with subsidy through partners e.g. retail stores). We have also been alerted to several risks to the credibility of CERT carbon savings which have arisen as a result of the proposal to increase the DIY loft insulation carbon score by 50% when it is already a cost effective measure. We have therefore decided to withdraw the amendment from the final Order.

9. Guidance

9.1 We will be looking to continue to engage with stakeholders such as energy suppliers, Ofgem, the energy efficiency industry, local authorities, charities and environmental organisations as we publish the amendments. Ofgem will be consulting on updating their detailed operational supplier guidance alongside these amendments. We will be issuing a press release alongside the Order, contacting all stakeholders

who responded to the CERT consultation and engaging these organisations on the operational detail through meetings and events as necessary.

10. Impact

10.1 The impact on business is expected to be positive in that the energy efficiency industry – manufacturers, retailers and installers will benefit from the revenue and employment benefits stimulated by an increase to the carbon saving obligation and energy supplier investment needed to meet this. The costs of the scheme can, and are expected to be, passed on in part to household electricity and gas consumers. Suppliers have an incentive to keep the costs of their obligations under CERT as low as possible in order to minimise the amount of any cost pass through to consumers. This reflects the competitive supplier market and the drive to acquire and retain customers.

10.2 Charities and voluntary bodies could also benefit from an increased contribution to their local energy efficiency schemes.

10.3 Independent analysis commissioned by DECC into the previous supplier obligation phase states that the obligation has led to no discernable evidence that the impact of the scheme has in any way had a deleterious effect on smaller companies. It argues that the obligation has typically resulted in the smaller players in the insulation and lighting business organising themselves to be effectively a "bigger player" thus overcoming the perceived problems for energy suppliers of dealing with small businesses. The innovation of directly supporting the manufacturer in the creation of energy efficient products should mean that the retailers of appliance and consumer electronics will not be disadvantaged by their size other than through normal commercial arrangements.

10.4 The impact on the public sector is positive. Local authorities and registered social landlords have worked successfully with suppliers to insulate social housing in the supplier obligation programmes. This is continuing in CERT, although at a lower level, as the large scale opportunities for cavity wall insulation and loft insulation in social housing have been already taken up. An independent study of EEC2 concluded that the programme contributed to insulation of 400,000 social housing homes, raising them to the Decent Homes standard.

10.5 An Impact Assessment is attached to this memorandum.

11. Regulating small business

11.1 The legislation does not apply to small business. The CERT obligation does not apply to new and small energy suppliers with fewer than 50,000 domestic customers. This means that new entrants will not have to set up CERT programmes while at an early stage. The draft Order contains other provisions that avoid the risk of creating barriers to new entrant companies: where a supplier prefers not to set up its own CERT programmes, then it may transfer all or part of its target to another supplier, purchase accredited performance from another supplier or contract out the operation of its programme.

12. Monitoring & review

12.1 Ofgem is required to report annually to the Secretary of State on suppliers' progress towards their carbon saving targets. Ofgem voluntarily report the headline information on a quarterly basis. The impact of CERT in how far it has achieved its carbon and energy saving ambitions, together with the range and number of energy efficiency measures installed, will be reported by Ofgem at the end the programme in summer 2011. The Government will also look to commission an independent review of the broader social and environmental costs and benefits at the end of the scheme, consistent with the independent reviews of the previous two three-year phases. More broadly, Government consulted earlier this year on a continued CERT type obligation following the end of CERT in March 2011 and up to December 2012. It is now reviewing consultation responses and will announce decisions shortly.

13. Contact

Nicholas Taylor at the Department of Energy and Climate Change; Tel: 0300 068 5154 or email: nicholas.taylor@decc.gsi.gov.uk can answer any queries regarding the instrument.

Summary: Intervention & Options		
Department /Agency: DECC	**Title: Impact Assessment of the Electricity and Gas (Carbon Emissions Reduction) (Amendment) Order 2009**	
Stage: Final Proposal	**Version:** 2a	**Date: 25th June 2009**
Related Publications: CERT Order 2008, CERT Amendment Order 2009, CERT amendment consultation, Community Energy Saving Programme consultation and Order, Heat and Energy Saving Strategy Consultation		

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

Contact for enquiries: Nick Taylor **Telephone:** 0300 068 5154

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

The Carbon Emissions Reduction Target is designed to address market barriers to the cost effective uptake of energy efficiency and carbon reduction measures in the household sector, to ensure that homes reduce their carbon dioxide emissions and consumers are made more aware of their energy use. The amendments will increase the effort required by energy suppliers, and encourage suppliers to further promote innovative and behavioural measures.

What are the policy objectives and the intended effects?

The purpose of CERT is to help electricity and gas consumers in the GB household sector to reduce the carbon impact of their home through promoting measures which improve the energy efficiency of the fabric of the property, use energy more efficiently, reduce energy consumption and use energy from microgeneration sources. In doing so they will reduce consumers' fuel costs (and/or allow consumers to enjoy greater comfort). Through achieving carbon savings, the primary aim of CERT is to make a significant contribution to the UK's legally binding international target and its domestic targets. It is expected that it will also contribute to the alleviation of fuel poverty.

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

At the consultation stage, Government considered the following three options, which were discussed in the Partial Impact Assessment published at that time:

1. A 20% increase in the carbon emissions reduction target, together with the introduction of energy saving measures focussed on householders' behaviour with an upfront carbon score, the provision of additional incentives for loft insulation and an uplift in the innovative activity ringfence to 10%.
2. A greater or lesser percentage increase in CERT, together with amendments as option 1.
3. The proposal - a 20% increase in the carbon emissions reduction target, together with the introduction of energy saving measures focused on householders' behaviour within a capped ringfence, an uplift in the innovative activity ringfence to 10% and the removal of direct mail CFLs as qualifying measures from 1 January 2010.

When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects? Summer 2011

Ministerial Sign-off For final proposal/implementation stage Impact Assessments:

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:

..... Joan Ruddock Date: 29 June 2009

Summary: Analysis & Evidence

Policy Option: 3	Description: A 20% increase in CERT; change in cost benefits presented

COSTS

ANNUAL COSTS	
One-off (Transition)	**Yrs**
£ 394 million	3
Average Annual Cost (excluding one-off)	
£	

Description and scale of **key monetised costs** by 'main affected groups'

- Cost to energy suppliers, which may be passed on to customers: PV=£582 million
- Cost to householders to part pay for measures: PV=£363 million
- Cost to Local Authorities and Social Landlords: PV=£160 million

Total Cost (PV) **£ 1,105 million**

Other **key non-monetised costs** by 'main affected groups' : Households 'hidden' costs e.g. time invested when having a measure installed

BENEFITS

ANNUAL BENEFITS	
One-off	**Yrs**
£	43
Average Annual Benefit (excluding one-off)	**Yrs**
£ 160 million	43

Description and scale of **key monetised benefits** by 'main affected groups'. Reassessed with DECC's 2009 fuel prices projections.

- Benefits to UK of reducing fuel use: PV= £2,419 million.
- Comfort: PV= £488 million
- Reduction in carbon emissions in the non-traded sector: PV= £466 million
- Non-purchase of EU-ETS allowances: PV = £116 million
- Reduced air pollution: PV = £35 million

Total Benefit (PV) **£ 3,523 million**

Other **key non-monetised benefits** by 'main affected groups'

Improvement in energy security due to reduced energy demand; supporting innovation via incentives; helping to address fuel poverty and the avoided cost of renewables.

Key Assumptions/Sensitivities/Risks

Cost of measures; Future energy prices; Mix of measures, i.e. numbers of installations for each measure (including considerations of constraints such as remaining potential, industry capacity, and consumer demand); Savings per measure; shadow price of carbon (a revised approach to carbon valuation is to be published shortly).

Price Base Year 2009	Time Period Years 43	**Net Benefit Range** (NPV) **£ N/A**	**NET BENEFIT** (NPV Best estimate) **£ 2,418 million**

What is the geographic coverage of the policy/option?				Great Britain
On what date will the policy be implemented?				1 August 2009
Which organisation(s) will enforce the policy?				Ofgem
What is the total annual cost of enforcement for these organisations?				£ 0.15m
Does enforcement comply with Hampton principles?				Yes
Will implementation go beyond minimum EU requirements?				Yes
What is the value of the proposed offsetting measure per year?				£ There is none
What is the value of changes in greenhouse gas emissions?				£ 466 million in the non-traded sector
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 £ 0 Decrease £ - **Net Impact** **£** 0

Key: **Annual costs and benefits:** **(Net) Present**

Evidence Base

Overview

1. 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. This supplier obligation, known as the Carbon Emissions Reduction Target (CERT), applies in England, Scotland and Wales. The CERT commenced on 1 April 2008, and concludes on 31 March 2011. It is the third three-year cycle of the household energy supplier obligation, formally known as the Energy Efficiency Commitment. The CERT Order 2008 (www.opsi.gov.uk/si/sis05-02), the explanatory memorandum and associated impact assessment, published on 5th February 2008, stand as an assessment of the rationale for, and the costs and benefits of CERT (www.defra.gov.uk/environment/climatechange/uk/household/supplier/cert.htm).

2. It is in the interest of households to improve the energy efficiency of their homes. Savings on energy bills and increased comfort can be significant, and payback periods can be relatively quick. For example, payback periods for cavity wall insulation and loft insulation are currently around 2 years. However, there are a well understood and broad suite of barriers to householder investment in energy efficiency measures which can be difficult to overcome and include: the hassle factor; a lack of trust, information or knowledge of the measures; up-front costs or simply other priorities in a householder's day-to-day life that prevent them from taking action. The supplier obligation is designed to help overcome these barriers as far as possible. It is recognised though, that some barriers, such as split incentives for a rental property, need additional drivers (see 2007 Energy White Paper and 2009 Heat and Energy Saving Strategy consultation). Other important practical factors that can potentially impede the delivery of improvements to household energy efficiency include a lack of appropriate market-ready technologies, lack of appropriate skills and supply-side constraints on the supply and installation of measures.

3. Household energy suppliers are well-placed to deliver carbon dioxide savings from their customers. Suppliers are uniquely placed to provide information about consumers' energy consumption through billing and metering processes and are well placed to inform them about the potential measures on offer. Suppliers can mitigate some of the risks and uncertainty faced by consumers around the value of energy savings and energy prices, and technical risks of measures installed. Additionally, suppliers are able to address financial barriers by providing subsidised measures or finance, and through accessing economies of scale in sourcing measures.

CERT key features

4. As set out in the CERT Order, the key features of CERT are:
   - CERT applies to all household gas or electricity suppliers with 50,000 or more customers.
   - Each supplier is assigned a target based on their number of customers, defined in terms of carbon reductions. Eligible measures (insulation, low-energy lamps, efficient appliances etc) each have a pre-determined carbon score, based on their expected lifetime savings, and set on the basis of specialist technical advice.
   - CERT requires 40% of each supplier's target to be delivered from a "Priority Group" of homes either on defined benefits or with older (aged 70 or over) occupants.
   - Suppliers must promote measures though schemes which are pre-approved by Ofgem (the gas and electricity regulator) who administers the scheme. Ofgem has powers to fine companies up to 10% of turnover for non-compliance, although all suppliers have overachieved their targets to date – being allowed to carryover excess measures to the next phase;
   - Suppliers are free to choose any mix of measures and to promote these to any home – they are not restricted to their own customers. In order for supply companies to meet their lifetime carbon saving target they have to install a combination of measures (which have prescribed lifetime carbon saving scores) which equal that target.
   - A wide range of measures are eligible, including energy efficiency measures, micro-generation technologies and behavioural measures. Suppliers use a number of innovative actions to meet targets, including partnerships with local authorities and social housing providers (e.g. council tax rebate schemes), joint initiatives with appliance manufacturers and retailers.

Cost Effectiveness of the Supplier Obligation

5. 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. The results suggest that household energy programmes, both as a group and individually, were among the most cost effective measures available to reduce UK 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 July 2008 www.nao.org.uk/pn/07-08/0708787.htm).

6. A large amount of evidence has been accumulated over the years on the supplier obligation, partly based on experience and evaluation and partly based on a programme of commissioned research. This evidence is available on the Defra and DECC websites and in quarterly updates and annual reports published on the Ofgem website. Evidence on energy efficiency policies is presented as part of the 2002 Energy White Paper, the 2004 Energy Efficiency Action Plan, the 2005 HMT/Defra Energy Efficiency Innovation Review, the 2006 UK Climate Change Programme Review, the 2006 Energy Review and the 2007 Energy White Paper. In addition, there are several data sources that present relevant information on an ongoing basis and are published regularly, including the English House Condition Survey and the Domestic Energy Fact File.

7. Evidence suggests that the supplier obligation has delivered greater savings to consumers than the cost to consumers, suppliers and government collectively. An independent evaluation of the April 2005 – March 2008 phase (by Eoin Lees Energy) estimated that stimulated by energy suppliers, over £1.1 billion has been directly invested in energy efficiency in the residential sector. The cost impact of EEC2 on a customer's fuel bill is likely to have been nearly £7 per fuel per year (including VAT). For the low income group, their contribution is likely to have been £5 per fuel per year including VAT. Householders are receiving ongoing benefits in the form of reduced energy bills and increased comfort with a net present value of £8.2 billion; or alternatively, for every £1 raised from householders, EEC2 will produce £9 in long term benefits. For every £1 raised from the low income group, EEC2 will produce £17 in long term benefits. Excluding deadweight, the life time carbon dioxide savings are nearly 59 million tonnes carbon dioxide from the measures required to meet the EEC2 target; achieved at a net benefit to GB of £53 per ton of carbon dioxide saved[2].

Justification for amending CERT

8. This impact assessment focuses on the costs and benefits of the 'proposal' (option 3). The central amendment addressed by this impact assessment is a 20% increase to the carbon emissions reduction target. This increase was trailed by Government on 11th September 2008 (www.number10.gov.uk/Page16814). The announcement proposed total new measures worth some £1 billion to help households secure permanent reductions in their energy bills. Details of the Home Energy Saving Programme, of which CERT amendments are a significant part, were published on the No10 website (www.number10.gov.uk/Page16807).

9. The Home Energy Saving Programme was a direct response to energy price increases. Increasing energy prices affect family budgets and increase the number of households in fuel poverty. The average annual energy bill in 2007 was £935 (around £400 for electricity and around £550 for gas bills). Average annual consumer energy prices increased by 6% for electricity and 5% for gas in

[2] Analysis in 2006 prices.

2008. One impact of the fuel price rises last winter and into 2009 is that bill savings during this period of high prices are much higher than otherwise. This reduces payback periods for the installation of energy efficiency measures delivered under CERT, thus making them more cost-effective e.g. if a household contributed £235 to cavity wall insulation (where a supplier contributes 50% of the cost), average savings after comfort taking are estimated at £111/year using 2007 fuel prices, giving a payback to the consumer of 2.1 years. Based on average annual 2008 prices, payback times for cavity insulation for a 3 bed semi would reduce to less than 2 years.

10. Suppliers installed and carried forward measures equivalent to almost 25% (37.8MtCO_2) of the CERT target from EECII. A substantial share of the CERT costs therefore fall outside of the CERT period, although the benefits persist. An increase of 20% in the CERT coupled with the new CESP obligation (announced as part of the Home Energy Saving Programme) restores supplier costs to that originally envisaged in the CERT Order.

Assumptions

11. This IA discusses the difference between two situations. The first is the current status quo, that is to say the companies working towards a target of 154 MtCO_2 as at present, which we refer to as the base case. The second (afterwards referred to as 'CERT +20%') is a new target of 185 MtCO_2[3].

12. In order to assess the impact of the proposed amendments to CERT effectively it has been necessary to make some amendments to the underlying assumptions set out in the consultation IA. These are detailed in the attached annex.

Alternative options considered

13. If the target was increased by more than 20 per cent then, at the margin, relatively expensive measures would have to be pursued which would benefit a limited number of households, but could substantially increase cost pass through onto bills. In other words, increasing the scale of the target beyond 20 per cent during a period of high energy prices could have greater consequences for the poorest households given their greater spending on energy as a proportion of income. An increased CERT beyond 20% would therefore have risked further increases to consumer fuel bills – precisely what the proposed amendments aim to alleviate. An increase of less than 20% was not considered to present sufficient impact on the number of energy efficiency measures delivered to

[3] It should be noted that our detailed assessment of the base case has changed somewhat since the information provided in the original CERT Impact Assessment in early 2008. Subsequent experience of the scheme in practice, including data supplied by Ofgem showing progress to date, has led us to assume a slightly different mix of measures being delivered by the companies in meeting their obligation, in particular containing more CFLs and fewer insulation measures.

households to deliver the Government's objectives, given the ambition level and volume of activity undertaken early.

14. Consideration was given to other amendments including:
    - Introducing a greater uplift to the market transformation ring-fence: this was rejected on the basis it would arguably allocate too much potential carbon to less well-tested and more expensive products for the same or fewer carbon savings, and would ultimately lead to a less equitable scheme i.e. fewer households would get more;
    - Professional loft insulation uplifts (a 50% uplifted score for professionally installed loft top up insulation in the able to pay sector and a 100% uplifted score in the Priority Group); to encourage improved offers from suppliers so that more households have the opportunity to benefit. This was rejected as there is no evidence that energy suppliers will improve their offers for loft top up insulation so an uplift could surrender significant carbon savings for no benefit. Following encouragement by Government to take early action last winter on the originally proposed amendments to the CERT, where energy suppliers did promote these qualifying measures, they will benefit from the uplifts for the period between 11th September 2008 and 31st July 2009;
    - DIY loft insulation uplift of 50%; to encourage additional take up of DIY insulation. This was rejected on the basis that it is already one of the most cost-effective measures in CERT; early action by energy suppliers has led to concerns about unintended consequences such as the potential for double counting of carbon; and the potential impact that an increase in the number of DIY measures may have on the numbers of other measures promoted and on jobs in the professionally installed insulation sector.

Impact of amendments

Increasing the carbon emissions reduction target by 20%

15. It is proposed to increase CERT by 20% meaning a new target of 185 million lifetime tonnes of CO_2 where originally it was 154 million lifetime tonnes of CO_2. This is equivalent to annual net savings of 5.6 $MtCO_2$ (as against an assumed 4.5 $MtCO_2$ in the base case[4]) by 2012. With 37.8$MtCO_2$ savings undertaken before CERT began and banked forward to CERT (thereby getting measures into households early and streamlining delivery between phases), suppliers' actual CERT to be achieved over this period is 147.2 $MtCO_2$.

16. This sets an ambitious, but achievable, target that would meet the government's objectives of delivering the maximum possible level of carbon and energy savings to 2011, whilst maintaining equity for consumers. For reasons of equity, at least

[4] As noted above, we have re-assessed the base case assumptions made at the start of the CERT period in the 2008 Impact Assessment. It was there assumed that savings would be 4.2 MtCO2

40% of this target must be met by delivering activity to a priority group comprising low income and elderly customers. This priority group target share is the same as specified in the original CERT Order. The total expected investment by energy suppliers in promoting carbon reduction measures throughout the CERT period is now expected to be £3.2 billion (non-discounted); as against the cost of meeting the original 154 MtCO2 target which we now evaluate at £2.6 billion[5]. Some 60% of this increased investment is expected to be directed at the priority group.

17. Ofgem's report on supplier's achievement by the fourth quarter of CERT (to March 2009) revealed that suppliers had achieved 60% of their original CERT; around 25% of the savings were achieved in carryover, and the rest in the first 12 months. On the basis of a 20% increase to the CERT target, measures delivered to date equate to 50% of the revised CERT. This level of delivery at such an early stage of the three year period, in addition to the level of carry-over, provides the confidence to increase the CERT as proposed and that this can be achieved cost-effectively.

Increasing the market transformation ring-fence

18. CERT encourages activity by suppliers to promote innovative measures or approaches by awarding an additional 50% of carbon savings to these measures. In order to limit any potential loss of carbon, the original Order set a ring-fence for demonstration and market transformation actions of no more than 6% of a supplier's obligation (increased to 8% where microgeneration accounts for at least 2% of a supplier's obligation). The proposal here is to increase the ring-fence to 10% (plus 2% for microgeneration). These proposals would allow suppliers to spend around £300 million on innovative products.

19. The market transformation ring-fence could see the amount of carbon credited in uplifts at up to 9.25MtCO_2 (50% of which stems from the original ring fence). We have assumed an average use of the ring-fence across suppliers of 7.5%, equivalent to 6.9MtCO_2. There is an additional unquantifiable risk if the measures within the ring-fence do not deliver the savings expected. Equally they could deliver more carbon than we are allowing. Given the tight cap proposed for behavioural measures, we expect all Real Time Displays and Home Energy Advice packages to be claimed as part of the innovation ring-fence to benefit from the 50% carbon uplift for innovative measures.

Introduction of behavioural measures with an upfront carbon score

20. Behavioural measures (Real time displays and Home Energy Advice) were proposed to be given upfront scores as:

[5] £2.8bn in the 2008 Impact Assessment

a. They offer real untapped potential for significant carbon savings. There are numerous studies which show that both Real time Displays (RTDs) and Home Energy advice can result in significant energy and bill savings from raising levels of understanding, awareness and stimulating conscious change in habits (e.g. 5 – 15% for RTDs) [6,7];

b. They can help people understand their energy use and empower consumers to take informed decisions on reducing their energy use which is critical if we are to meet our ambitious energy and carbon saving ambitions;

c. The September package was an offer to everyone and behavioural measures are not restricted by the building structure, thereby increasing the equity of the scheme;

d. Behavioural measures can help keep the cost of CERT down, and therefore help minimise cost pass-through to consumers;

e. RTDs help reduce demand for electricity which will benefit security of supply in advance of planned generation plant closures.

21. The score for RTDs is estimated, on the basis that while we are fully confident that they will deliver CO_2 and energy savings within the framework of CERT, we cannot yet score them directly (because as this is a new technology we do not have data stretching over the requisite timeframe). Nevertheless we believe that the carbon score proposed (at 0.996 lifetime tonnes of carbon dioxide savings) is quite conservative and justifiable - based on 3.5% annual electricity savings for 15 years, with the main studies (referenced here[8]) showing savings of 5% - 15%. However, RTDs using a short life battery (less than a year under normal operating conditions) will be awarded 50% of this carbon saving score.

22. Moreover many of the RTDs now emerging have functionality which goes some way beyond the early designs which will hopefully be reflected in the savings. A 2% behavioural measures cap would allow suppliers to promote in the order of 3.7 million RTDs or 5.4 million Home Energy Advice visits or a combination of the two at lower volumes, whilst capping the carbon risk. Given that attribution will be on customer share and that energy suppliers will

[6] http://www.prospectory.co.uk/id5.htm: A UK based opt-in trial involving 1,000 households used a simple display, and without any energy saving advice or incentives to save energy, resulted in average savings of 6% over one year. However, smaller scale opt-in trials by a Housing Association in Milton Keynes and an independent research trial (by The Prospectory) in Wales resulted in savings of 14% and 9% respectively on average electricity consumption

[7] http://www.hydroone.ca/en/media_centre/news_releases/archives/2006/2006_06_12.asp: RTDs rolled out to thousands of households in Ontario, Canada, as a result of average savings of 6.5% (range 5.1-16.7%) in electricity consumption use in a trial of over 400 households using a simple display for a 2.5 year period

[8] http://www.defra.gov.uk/environment/climatechange/uk/energy/research/pdf/energyconsump-feedback.pdf: International evidence suggests that expected savings from direct feedback are typically of the order of 10% (range 5-15%), even for relatively simple displays (Sarah Darby, 'A review for Defra of the literature on metering, billing and direct displays', April 2006)

promote these to differing levels, the overall level of behavioural measures delivered under CERT is estimated to be lower. Nonetheless, this should offer us an opportunity to explore, and build partnerships, around a technology which could drive significant energy savings.

23. To give householders a better understanding of how they use energy, especially heating controls, as well as the implications of energy-using products we propose to give a carbon score for face to face home energy advice (lifetime tonnes carbon dioxide savings of 0.675 equivalent to 1% electricity and 2% gas savings annually for 7.5 years). The proposal to include home energy advice as a qualifying measure under CERT with a conservative score is in recognition of the potential for energy and carbon savings[9]. Both Home Energy Advice and Real Time Displays are eligible to be promoted through the market transformation ring-fence.

Removal of direct mail CFLs from 1 January 2010

24. High numbers of direct mail CFLs (high efficiency light bulbs) have been sent out in the first year of CERT - 200 million (including carry-over from EEC2), equivalent to 16% of the uplifted target. CFL distribution is positive so long as the lamps are installed and saving carbon, or ensuring householders are more likely to replace incandescent bulbs with a CFL when their existing bulbs expire. However, Government is increasingly concerned that the number of lamps already distributed directly in CERT alone has been so high that it may work out at more than the average number of highest use light fittings in a house. We also understand that some households have received more than the average number. As such, there is an increasing risk to carbon savings under the scheme where lamps are not used, are installed on low use light fittings, or replace existing CFLs.

25. We have therefore taken three actions:

[9] www.power2save.ca/pdf/feedback-sarahdarby.pdf): A community programme involving home energy audits for 1,600 households, followed by subsidised retrofitting according to customer choice, achieved an estimated reduction of 20% in peak demand. www.groundwork.org.uk/upload/news/29_document1.pdf: The Green Doctor Project, involved free, one-off visits to low-income households in priority wards in Leicester city between 2003-2006. Using a combination of technical and non-technical measures, 794 home visits were carried out, which led to savings of £9,971 per year in energy costs (a saving of as much as £59,826 over the three year lifetime of the project), and carbon savings of an estimated 68,154 kg (68.15 tonnes) per year and 408,922 kg (408.92 tonnes) over three years (www.gca.ca/indexcms/pdf/EGH%20and%20CHIP.pdf):EnerGuide Audits, Canada, launched in 1998 and is said to be a proven effective tool for achieving energy savings (in conjunction with a retrofit incentive grant) averaging 28 per cent.

a. From 1st January 2010 to include as eligible under CERT, only those schemes which result in the direct purchase of a CFL[10];
b. To reduce the estimated annual savings associated with CFLs, in line with average annual use indicated by the Market Transformation Programme. We intend to keep the lifetime of the measures (in years) the same. In the original CERT Explanatory Memorandum (2008), the score was based on the assumption that householders would replace the 3rd, 4th, 5th and 6th most used lamps with CFLs. The average use of these lamps is estimated as 566 hours. However, given the large number of CFLs delivered through EEC and CERT, this assumption is probably no longer valid, and therefore, when determining fuel savings, DECC has assumed an average use of 460 hours per year (which is the average of all lamps). Suppliers will still receive the same carbon score as laid out under the legislation, but when estimating the savings from the project, the annual savings assumed have been reduced[11];
c. To reduce the amount of carbon assumed to be delivered by CFLs under the scheme by 5% in light of evidence that not all lamps distributed are being used;
d. The combined effect of (b) and (c) is to reduce the savings associated with CFLs by 23%.

Benefits and costs

26. CERT, as amended with the central proposal of a 20% increase and given the assumptions set out in the attached annex, is expected to present the following costs and benefits. The costs and benefits of CERT are established using an Illustrative Mix of Measures representing a balanced selection of measures. The data and assumptions underlying the Illustrative Mix are informed by information provided by energy suppliers, by representatives of the industries concerned, and by experts, including the Energy Saving Trust (EST) and the Building Research Establishment (BRE). As set out in the original impact assessment, the analysis behind the illustrative mix takes account of a number of issues including an understanding of supply chain constraints, consumer demand levels, remaining opportunities and previous installation delivery rates; the costs of measures and installation; the expected household contribution and the carbon dioxide savings associated. CERT is a market based mechanism with suppliers operating as cost effectively as possible so as to retain customers by keeping prices down.

27. The **net resource cost** over the CERT +20% programme for all parties is approximately £5.3 billion. This represents an increase of £1,105 million as compared to the base case mix. The total cost of measures include deadweight

[10] Ofgem already has some rules in place to restrict the number of CFLs distributed in direct mailings. It is not clear what the additional impact of the new, tighter restrictions will be. For the purposes of this Impact Assessment we have not taken the further restrictions into account.
[11] Data for use of light bulbs is based on a report by the Electricity Association (1997), "Domestic Lighting in the UK: Customer survey". London, UK.

and implementation cost assumptions i.e. that householders would have installed some of these measures anyway, even with no subsidy. Given that the supplier obligation has been in place since 2002, annual deadweight figures for cavity wall insulation and loft insulation are based on information from prior to EEC (e.g. 240,000 and 210,000 professional cavity wall insulation and loft insulation installations respectively; and 18 million CFLs).

28. Implementation and administration costs represent around 11.2% of total costs or 18.4% of suppliers' costs. The suppliers' share of total costs is £3.2 billion (undiscounted). The non discounted supplier share of the increase is £582 million.

29. The total Net Present Value (NPV) including external benefits is therefore estimated at PV £14.3 billion, an increase of £2.4 billion as compared with the new base case mix when analysed in the same way[12]. The annual benefits (net of costs) are £649 million for the lifetime of the measures. This represents an increase of £110 million as compared to the annual net benefits of the base case mix).

30. As part of the EU climate and energy package, the UK has agreed to a renewable energy target. This target requires an increasing proportion of UK final energy consumption over the period 2011 to 2020 to be from renewable sources, reaching 15% by 2020. For comparison, 2.5% of UK final energy consumption was from renewable sources in 2007. At the margin the target is thought to be costly, with the renewable energy generation (or fuel) costing significantly more than alternative sources of energy, even after valuing the relative carbon benefits of renewables. Changes in the level of UK final energy consumption can reduce the level of renewables that are required to be installed and so reduce the additional costs of the renewable energy target. These cost savings have not been evaluated, but it is estimated that the revised CERT will reduce the annual renewables requirement by 2.61 TWh in 2020, an increase of 0.4 TWh/year as compared to the base case mix.

31. CERT will deliver **environmental** benefits by reducing carbon dioxide emissions by 5.6 $MtCO_2$ per year by the end of the programme, an increase of **1.1** $MtCO_2$/ year as compared to the base case, helping to tackle climate change and improve local air quality. The annual carbon dioxide savings equate to about 3.8% of current emissions from the household sector. In addition, reduced energy demand will moderate wider environmental impacts of energy extraction, production and supply. In contributing to the Government's climate change abatement programme, all consumers will share the benefits such as cleaner air and the mitigation of carbon dioxide emissions from reduced energy production. The amended CERT is expected to be highly cost-effective with around £228

[12] Note that this does not include the benefits of avoided renewables costs.

benefits per tonne of carbon dioxide saved in the traded sector (electricity) and £153 benefits per tonne of CO_2 saved in the non-traded sector (gas, oil and coal). This includes all quantified ancillary benefits, except for the avoided cost of renewables.

Climate Change Policy Cost-Effectiveness Indicator

32. All Impact Assessments that estimate changes in CO_2 emissions in excess of either (i) 0.1Mt CO_2e average per year for an appraisal of less than 20 years, or (ii) 2.0Mt CO_2e 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 CO_2 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/ CO_2e lifetime and 0.05mt/ CO_2e for annual savings.

33. 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:

34. In the non-traded sector there was a WAD SPC of £20.60 with a CEI of -£153.86. This means that 100% of emissions fell under the SPC. In the traded sector the WAD EUA was £20.13 and the CEI was -£228.60. This again means that 100% of emissions fell under the EUA price.

35. 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 amendments to CERT.

36. CERT+20% is expected to result in wider environmental benefits including: ; large quantified benefits from a reduction in fuel use (PV = £14.2 billion); reduced purchase of EU-ETS allowances (PV = £1.2 billion) increased comfort (PV = £2.2 billion); the reduction in carbon emissions in the non traded sector (PV = £1.7 billion); and, reduced air pollution (PV = £0.3 billion). These represent increases in the savings produced by the base case of £2.4 billion (from fuel savings); an increase of £488 million from increased comfort; an increase of £466 million from the shadow price of carbon, an increase of £116 million in the avoided purchase of EU-ETS allowances and an increase of £35 million in air pollution benefits.

37. CERT, as amended, would provide other additional **economic benefits** in promoting innovation by creating market opportunities for new or more efficient technologies and by providing certain incentives for demonstration and market transformation.

38. CERT will also contribute to **improved security of energy supply** by reducing demand in the domestic sector. Projected annual savings from the policy in 2012 are: 7.78 TWh/year electricity, 10.38 TWh/year gas, 0.77 TWh/year oil, 0.35 TWh/year coal, although these will fall in subsequent years as the measures reach the end of their lifetimes. These figures have been corrected for deadweight and comfort taking. For comparison, electricity use in the domestic sector was 115 TWh in 2007 and gas use was 350 TWh. Other pressures may increase electricity demand.

39. Costs for CERT (and past EEC) were based on discussions with energy suppliers, the relevant industries and the Energy Saving Trust taking into account evidence from the energy suppliers and independent evaluations about the costs of past programmes and the costs of the Government's Warm Front programme. The costs for CERT have been similarly estimated on the basis of discussions with suppliers of carbon reduction products and services, plus information about the costs of the EEC 2005-08.

40. The costs given in this impact assessment are the total net resource costs, not just the subsidies expected to be given by suppliers through the CERT. In other words, some beneficiaries of the CERT programme are given a 100 per cent subsidy, whilst others part fund the product or service provided. All the monies spent by the suppliers, homeowners and landlords are counted, and then debited by the estimated business as usual investment in these energy savings measures during the CERT period. The corresponding savings are discounted at the 3.5 per cent Treasury rate for the first 30 years, 3% thereafter.

41. It is estimated that the total cost to suppliers would be around £122 per household for the 3 years of the CERT + 20% programme, as opposed to £100 for the base case mix (see Appendix). This equates to around £41 per household per year for the three years of the scheme. However, data from Ofgem is that suppliers carried over some 25% of their CERT, with the activity delivered early, before the CERT phase. If we assume that the costs associated with this activity were passed on to consumers at the time and outside the CERT period, then the estimated annual cost passed onto consumers is some £32 per household for the three years of the scheme. This is lower than the costs previously assumed for CERT in the January 2008 Explanatory Memorandum.

42. These costs are balanced by average annual benefits, in terms of lower energy bills or increased comfort, of about £45 per household per year for the lifetime of

the measures, continuing for many years (40 years) beyond the CERT period. For comparison, the new base case mix is expected to save £37 per household per year, if calculated on the same basis (i.e. including comfort benefits).

43. DECC has commissioned work to begin to understand and quantify **hidden costs** and benefits associated with different energy and carbon savings measures for homes. This work concentrated on actual costs i.e. tangible time and financial costs experienced by households and the perception of these costs, i.e. perceived costs will vary from individual-to-individual, taking into account factors such as environmental awareness/ motivation, familiarity with technology and attitudes towards the technology. An extensive UK and international literature review has been undertaken, however quantitative published data was very limited. These indicative values have not been included here as DECC continues to monitor a number of ongoing UK studies. DECC also welcomes views and suggestions for improving this understanding. Hidden costs potentially having a significant impact on the payback period (e.g. cavity wall insulation has an indicative hidden cost range of £30 to £170).

44. The estimated annual energy savings to consumers, after subtracting comfort taking, would reach a total of around £1.175 billion in 2012, an increase of £193 million as compared to the base case mix, if analysed on the same basis. The reason for this is that the revised mix contains high numbers of relatively short lived measures (such as CFL's and appliances), which save electricity (a more expensive fuel than gas). Annual savings to consumers will fall when these lights and appliances reach the end of their lifetimes.

45. The above analysis of costs and benefits relates to the Government's Illustrative Mix of Measures. Under EEC 2002-08, the measures adopted by suppliers have been broadly in line with the Illustrative Mixes for the respective programmes. However, if suppliers were to adopt a different mix of measures, the outcomes in terms of costs and benefits could be different, because of the differing cost/savings ratios of measures, and disparate prices of electricity and fossil fuels. In addition, there are likely to be some rebound effects, over and above comfort taking (e.g. consumer savings may be spent on buying new electrical items or flights). The macro economic rebound effect needs to be taken into account when assessing policies as a whole, in the context of CO_2 projections and carbon budgets and is not, therefore, estimated policy-by-policy.

46. The proposed target is based on comprehensive analysis. If, in the event of unforeseen circumstances that significantly affected the Government's assumptions, it were necessary to reconsider the level of carbon reduction obligation, any amendment would be effected by a further statutory instrument, following consultation.

Equity and fairness

47. CERT costs will potentially be passed on in full or in part to consumers of electricity and gas through their bills. The Government has considered how it can best achieve its climate change abatement objectives through the CERT whilst ensuring equity and fairness for consumers. For those consumers receiving energy efficiency measures under CERT the savings are likely to outweigh any increase in their bills. Some consumers may receive measures at no cost, while others may receive subsidised measures. Some households may benefit from more than one measure.

48. Those on low incomes are most likely to be affected by any increase in energy bills since they spend a higher proportion of their income on electricity and gas. To help ensure an equitable distribution of benefits, CERT as amended, would provide additional **social benefits** by proportionally increasing (by 20%) the size of the 40% target which suppliers are obligated to meet in a Priority Group of low income households, those on disability benefits and those with a household member aged 70 or over.

49. CERT activity to promote energy efficiency can reduce fuel bills and improve comfort, thus also contributing to the alleviation of fuel poverty and the risk of ill health caused by cold homes, particularly for children and the elderly. Of the £3.2 billion investment expected to be stimulated by energy suppliers in meeting their carbon reduction targets, some £1.9 billion (approximately 60%) is expected to be directed at the Priority Group.

50. While the measures installed under CERT +20% programme would provide an average annual ongoing benefit for consumers of about **£45 per household** (for the lifetime of the measures), there is a proportion of consumers whose energy bills will increase as a result of CERT, but who may not receive corresponding energy saving measures under the scheme. These are most likely to be households living in private rented accommodation and some owner occupiers in older houses, which do not have the potential for cavity wall insulation, and/or who may have already carried out all cost-effective energy saving measures in their home.

51. These consumers may still benefit from retail goods promoted by suppliers, such as high efficiency appliances and other energy saving products. The Order also retains a 12.5% flexibility option, under which an energy supplier would be able to notify Ofgem that it wished to achieve a proportion of its priority group obligation by focussing specified measures on low-income consumers who are more likely to be in fuel poverty.

Competition issues, Small firms' impact, Race equality, gender equality and rural impact, Implementation and enforcement, Monitoring and evaluation

52. We do not envisage any change in the outcomes from the increase in the scale of CERT as compared to the original CERT impact assessment.

Consultation

53. In developing its amendment proposals for CERT, the Government has engaged with a wide range of stakeholders, including electricity and gas suppliers, representatives of energy efficiency industries, local authorities and other representative bodies and organisations with an interest in energy efficiency, carbon reduction, fuel poverty and the environment. The Government held consultation events in March 2009, with the support of the Energy Efficiency Partnership for Homes. A formal consultation was published on 12th February and concluded on 14th April. A summary of responses is available alongside this impact assessment.

54. 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	***Results in Evidence Base?***	***Results annexed?***
Competition Assessment	No	No
Small Firms Impact Test	No	No
Legal Aid	No	No
Sustainable Development	Yes	No
Carbon Assessment	Yes	No
Other Environment	Yes	No
Health Impact Assessment	No	No
Race Equality	Yes	No
Disability Equality	Yes	No
Gender Equality	Yes	No
Human Rights	No	No
Rural Proofing	No	No

Annex

ASSUMPTIONS AND CENTRAL COST BENEFIT SCENARIO

1. A number of assumptions made in the original CERT Explanatory Memorandum have been changed. This IA represents the difference between two illustrative mixes, the first (afterwards referred to as the 'base case') having a target of 154 $MtCO_2$, and the second mix (afterwards referred to as 'CERT +20%') a target of 185 $MtCO_2$. The first mix has been modified in the light of data supplied by Ofgem showing progress to target to date. It is therefore not exactly the same as the original mix presented in the 2008 impact assessment, in particular it contains more CFLs and fewer insulation measures, reflecting delivery to date.

2. The revised illustrative mixes take account of a number of policy changes as set out in this IA and changes to the assumptions presented throughout the impact assessment, including:

   I. implications of carryover of various measures and associated carbon (measuring 25% of the original CERT) from EECII;

   II. increased the carbon saving obligation by 20% from 154$MtCO_2$ to 185$MtCO_2$;

   III. an average market transformation ring-fence use of 7.5% where previously none was assumed;

   IV. the impact of proposed amendments, including loft insulation uplifts, in place from 11th September and up to 31st July 2009;

   V. the addition of behavioural measures with an upfront carbon score (i.e. real time displays and home energy advice within a 2% cap). The carbon saving score for real time displays is based on the assumption that, on average, a household would save 3.5% of their electricity for a period of 15 years. This equates to a saving of 154 kWh/year of electricity and a lifetime CO_2 saving of 0.996 tCO_2. The carbon saving score for home energy advice is based on the assumption that the average household would save 1% of electricity and 2% of gas for 7.5 years. This equates to electricity savings of 44 kWh/year and gas savings of 374 kWh/year. The lifetime CO_2 saving score is 0.675 tCO_2. The assumed prices are £20 for RTD's and £35 for home energy advice. There are additional administration costs (estimated at £5.70 for RTD's and £10 for home energy advice);

   VI. Ofgem's regulations have been amended to allow suppliers to claim carbon savings from replacement of the most inefficient boilers (rated "G" according to SEDBUK). Carbon reductions will be accredited based on the increase in efficiency from G (65%[13]) to A/B rated (market average, 88.3%) and the assumed lifetime is 6 years (i.e. it is assumed that the boiler would have been replaced in around 6 years anyway). The lifetime

[13] This figure represents G-rated efficiency of 66% minus 1% to account for poor controls.

carbon saving for a three bedroom semi detached house is 6.82 tonnes CO_2;

VII. amended numbers of measures being installed in light of an improved understanding of supply chain constraints, consumer demand and supplier choice impacting which measures are being promoted and taken up;

VIII. the lifetime of each measure is taken into account separately, instead of using a single lifetime per fuel;

IX. the energy and carbon savings from CFLs have been revised downwards. In the original mix for CERT, it was assumed that most houses would have 2.1 CFLs (which is the figure from a Lighting Survey carried out by EST in 2007). It was also assumed that CFLs delivered through CERT would replace the next most used bulbs, which, on average, would be used for 566 hours per year. In light of evidence highlighted in the impact assessment, it has now been decided to revise this estimate downwards, to the average figure of 460 hours per year; together with an assumption that 5% of CFLs are not fitted. Estimated costs of CFLs have been reduced.

X. The costs for solid wall insulation increased in line with a recent report commissioned by the Energy Saving Trust[14];

XI. For some measures, the relative share of costs of measures paid by suppliers, householders and the social housing sector has been changed;

3. The carbon saving scores for all measures remain the same as in the original Illustrative mix and Ofgem will continue to apply these scores. At least 40% of the obligated carbon saving target will continue to delivered in a Priority Group of low income and vulnerable households

4. Key assumptions reducing the cavity wall insulation installation rate and increasing the CFL distribution rate have had a significant effect on the overall mix. All cost benefit analysis has been carried out according to new procedures from the Inter-Departmental Analysts' Group[15]. This has also a significant effect on the results. In particular:

    I. Following new guidance from the Inter-Departmental Analysts' Group, **the marginal carbon factor for electricity has been assumed to decrease after 2025 as the grid decarbonises**. This is an important difference as compared to previous analysis and affects the estimated lifetime carbon savings of the programme. However, the suppliers' target remains the same, and Ofgem will continue to apply the carbon saving scores agreed before the start of the CERT programme.

    II. All calculations are carried out relative to DECC's 2009 projections for fuel prices (both the retail and variable components). Calculations in the consultation IA were carried out relative to the 2008 projections.

    III. Air pollution calculations are included. Since biomass has a large effect on air pollution figures, and since it is not certain that any biomass measures will be installed, the air pollution figures have been

[14] "Solid Wall Insulation Supply Chain Review", EST, April 2009
[15] "Greenhouse Gas Policy – Evaluation and Appraisal in Government Departments", May 2009

calculated assuming that most of the biomass measures are installed in rural areas.

IV. There has been a reassessment of the amount of coal savings from heat pumps.

5. In summary the tables which follow present:

I. **Table 1** compares the amended CERT+20% mix to the base case mix;

II. **Table 2** summarises the differences between these mixes;

III. **Table 3** shows the CO_2 savings from each mix;

IV. **Table 4** shows the cost benefit analysis of the CERT+20% mix and of the base case mix, according to the new IAG procedure. The final column shows the difference between the two. Note that the base case mix has been analysed according to the new IAG procedure. Furthermore, it has been assumed that only 95% of CFL's delivered are used, and that they are used for 460 hours per year instead of 566 as previously assumed.

V. **Table 5** shows two different estimates of the annual benefits to consumers:

I. Annual benefits in the first year after the policy ends, i.e. 2012. This is the parameter that was quoted for the original CERT Impact Assessment.

II. Annual benefits over the entire lifetime of all the measures (i.e. 43 years; the longest lived measures last 40 years and the last one could be installed in 2011).

VI. **Table 6** shows the assumed costs of CFL's and Solid Wall Insulation. Large numbers of CFL's have been delivered through CERT, suggesting that they are considerably more cost effective for suppliers than was previously assumed. Government has no direct information on suppliers' costs. For the purposes of the illustrative mix, the price assumed has been adjusted downwards to make CFL's comparable in cost effectiveness to DIY loft insulation. Prices for solid wall insulation have been revised in line with those given in the EST's "Solid Wall Insulation Supply Chain Review".

VII. **Table 7** shows the assumed breakdown of solid wall insulation costs by social and non social sector. To date, almost all solid wall insulations funded through EEC have been in the social housing sector. However, wallpaper insulation is mainly marketed at the private sector. Anecdotal evidence (from the consultation responses) suggests that suppliers' contribution is lower than previously assumed.

VIII. **Table 8** shows the changes in assumptions brought by the new Inter-Departmental Analysts' Group guidelines on estimating cost effectiveness. Revised methodology for the assessment of benefits in accordance with guidelines from the Inter-Department Analysts Group mean that the avoided renewable costs are no longer calculated whilst avoided air pollution costs are include. There is also a change in the estimate of projected fuel prices.

SUPPORTING TABLES

Table 1: Illustrative Mixes for base case (blue columns) and for the CERT + 20% (yellow columns)

Carbon saving measure	Number of measures : Base case			Number of measures : CERT+20%		
	PG	Non-PG	Total	PG	Non-PG	Total
Cavity wall insulation	865,570	972,124	1,837,694	1,100,000	1,200,000	2,300,000
Loft insulation (professional)	0	0	0	0	0	0
Loft insulation professional (from < 60mm)	314,752	567,072	881,824	400,000	700,000	1,100,000
Loft insulation professional (from > 60mm)	590,161	810,104	1,400,265	750,000	1,000,000	1,750,000
Loft insulation (DIY)	196,720	1,182,751	1,379,471	250,000	1,460,000	1,710,000
Glazing E to C rated	7,868	32,404	40,272	10,000	40,000	50,000
A/B rated boilers (exceptions)	39,343	113,414	152,757	50,000	140,000	190,000
Fuel Switching	43,277	52,656	95,933	55,000	65,000	120,000
Heating controls - upgrade with boiler	39,343	81,010	120,353	50,000	100,000	150,000
Heating controls - extra	629,505	1,174,651	1,804,156	800,000	1,450,000	2,250,000
CFLs - retail	3,931,203	26,306,913	30,238,116	4,000,000	26,000,000	30,000,000
CFLs - direct	117,936,117	91,062,394	208,998,511	120,000,000	90,000,000	210,000,000
Appliances - Cold	590,161	2,430,312	3,020,473	750,000	3,000,000	3,750,000
Appliances - Wet	196,720	526,567	723,287	250,000	650,000	900,000
Appliances - iDTVs	786,882	4,050,521	4,837,403	1,000,000	5,000,000	6,000,000
Tank insulation - top-up	118,031	121,514	239,545	150,000	150,000	300,000
Draughtproofing	39,343	40,504	79,847	50,000	50,000	100,000
Wood pellet stoves (secondary)	0	80	80	0	100	100
Wood pellet boilers (primary)	0	1,619	1,619	0	2,000	2,000
Photovoltaic panels (2.5 kWp)	0	40	40	0	50	50
Solar Water Heater (4m²)	19	607	626	25	750	775
micro Wind (1 kWp, 10% LF)	0	40	40	0	50	50
micro Hydro (0.7kWp, 50% LF)	0	16	16	0	20	20
Ground source heat pumps	0	971	971	0	1,200	1,200
SWI external	23,605	16,202	39,807	30,000	20,000	50,000
SWI internal	11,016	11,341	22,357	14,000	14,000	28,000
Air source heat pumps	78	971	1,049	100	1,200	1,300
Mini-wind 5 kW, 20% LF	0	40	40	0	50	50
Wood chip CHP	786	323	1,109	1,000	400	1,400
Community GSHP	196	607	803	250	750	1,000
Efficient halogens	0	24,303,130	24,303,130	0	30,000,000	30,000,000
Insulated wallpaper	786	5,670	6,456	1,000	7,000	8,000
Community heating to wood chip	8,812	4,212	13,024	11,200	5,200	16,400
Log burning stoves	0	40	40	0	50	50
mCHP (80% heat, 15% elec)	39	283	322	50	350	400
PC mains panels	786,882	5,670,730	6,457,612	1,000,000	7,000,000	8,000,000
Energy saving kettles	78,687	283,535	362,222	100,000	350,000	450,000
RTD's	786,882	405,051	1,191,933	1,000,000	500,000	1,500,000
Advice only	0	0	0	500,000	500,000	1,000,000
Replacement of G rated boilers	0	0	0	25,000	45,000	70,000
LNBs	0	40,504	40,504	0	50,000	50,000

Table 2: Difference in Numbers of Measures (CERT+20% - base case)

	Difference between numbers of measures in CERT=20% and base case mixes		
	PG	**Non-PG**	**Total**
Cavity wall insulation	234,430	227,876	462,306
Loft insulation (professional)	0	0	0
Loft insulation professional (from < 60mm)	85,248	132,928	218,176
Loft insulation professional (from > 60mm)	159,839	189,896	349,735
Loft insulation (DIY)	53,280	277,249	330,529
Glazing E to C rated	2,132	7,596	9,728
A/B rated boilers (exceptions)	10,657	26,586	37,243
Fuel Switching	11,723	12,344	24,067
Heating controls - upgrade with boiler	10,657	18,990	29,647
Heating controls - extra	170,495	275,349	445,844
CFLs - retail	68,797	-306,913	-238,116
CFLs - direct	2,063,883	-1,062,394	1,001,489
Appliances - Cold	159,839	569,688	729,527
Appliances - Wet	53,280	123,433	176,713
Appliances - iDTVs	213,118	949,479	1,162,597
Tank insulation - top-up	31,969	28,486	60,455
Draughtproofing	10,657	9,496	20,153
Wood pellet stoves (secondary)	0	20	20
Wood pellet boilers (primary)	0	381	381
Photovoltaic panels (2.5 kWp)	0	10	10
Solar Water Heater (4m²)	6	143	149
micro Wind (1 kWp, 10% LF)	0	10	10
micro Hydro (0.7kWp, 50% LF)	0	4	4
Ground source heat pumps	0	229	229
SWI external	6,395	3,798	10,193
SWI internal	2,984	2,659	5,643
Air source heat pumps	22	229	251
Mini-wind 5 kW, 20% LF	0	10	10
Wood chip CHP	214	77	291
Community GSHP	54	143	197
Efficient halogens	0	5,696,870	5,696,870
Insulated wallpaper	214	1,330	1,544
Community heating to wood chip	2,388	988	3,376
Log burning stoves	0	10	10
mCHP (80% heat, 15% elec)	11	67	78
PC mains panels	213,118	1,329,270	1,542,388
Energy saving kettles	21,313	66,465	87,778
RTD's	213,118	94,949	308,067
Advice only	500,000	500,000	1,000,000
Replacement of G rated boilers	25,000	45,000	70,000
LNBs	0	9,496	9,496

Table 3: Difference in energy and carbon savings between the base case and CERT+20% mixes

	Base case	CERT+20%	Difference
Lifetime CO_2 savings, excluding deadweight and comfort, $MtCO_2$	112.4	139.4	27.0
Lifetime CO_2 savings, including deadweight, excluding comfort, $MtCO_2$	138.0	166.6	28.7
Reduction in target because of uplifts on loft insulation $MtCO_2$	3.7	3.7	0.0
Reduction in target because of uplifts on market transformation activity	4.6	6.9	2.3
Loss of savings due to new assumptions about CFL's (95% are used, average use per year reduced from 566 hours to 460 hours)	7.8	7.8	0.0
Annual CO_2 savings in 2012, net of deadweight and comfort $MtCO_2$/year	4.5	5.6	1.1
Annual CO_2 savings in 2020, net of deadweight and comfort $MtCO_2$/year	4.2	5.1	0.9

Note that the annual savings will be lower in subsequent years, as short lived measures stop working.

Table 4: Cost benefit analysis

Parameters	Base Case	CERT+20%	Additional costs/benefits of CERT+20% as compared base case
COSTS - NON-DISCOUNTED			
Suppliers' costs - non-discounted £millions	2,620	3,202	582
Householders' costs (non-discounted) £millions	1,195	1,558	363
Social housing costs (non-discounted) £millions	351	511	160
COSTS – DISCOUNTED TO 2009			
PV of suppliers' costs £millions	2,620	3,202	582
PV of householders' costs £millions	1,195	1,558	363
PV of social housing providers' costs £millions	351	511	160
PV of total costs £millions	***4,166***	***5,271***	***1,105***
Annual total cost £millions	***1,487***	***1,882***	***394***
BENEFITS			
PV of benefits to UK through reductions in energy consumption £millions	11,769	14,188	2,419
PV of benefits to UK through increased comfort for householders £millions	1,694	2,182	488
PV of benefits to UK through shadow cost of carbon £millions	1,224	1,690	466
PV of benefits to UK through avoided purchase of EU-ETS allowances £millions	1,080	1,195	116
PV of benefits to UK through reduced air pollution £millions	292	326	35
PV of total benefits to UK excluding avoided renewables £millions	**16,059**	**19,582**	**3,523**
Annual total benefits £millions excluding avoided renewables £millions	***728***	***888***	***160***
NET BENEFITS			
NPV including external benefits except the avoided cost of renewables £millions	**9,297**	**11,099**	**1,802**
Annual net benefit to the UK including external benefits except avoided renewables benefits - £millions/year	**539**	**649**	**110**

Table 5: Different ways of calculating annual costs and benefits to householders (NB not used in cost benefit analysis)

	Base case	CERT+20%
Suppliers' cost per household per year for the 3 years of the CERT period£	£32.23	£40.73
Suppliers' cost per household per year £ if do not count cost of carryover	£24.32	£32.41
Annual benefits per household for lifetime of measures (43 years), if fuel saved is valued at the retail price. This figure includes the benefit of comfort. £/household/year	**£36.5**	**£47.9**
Annual benefits to householders in 2012, if fuel saved is valued at the retail price. This figure includes the benefit of comfort. £/household/year	**£40.6**	**£63.3**

Table 6: Assumed costs of CFL's and Solid Wall Insulation

	Basic price		**Administration costs (additional to basic price)**	
	Original CERT Explanatory Memorandum	**New assumption**	**Original CERT Explanatory Memorandum**	**New assumption**
Retail CFL's	£2.1	£1.1	£0.61	£0.32
Delivered CFL's	£3.2	£2.3	£0.93	£0.67
External solid wall insulation	£4,500	£8,500	£236	£259
Internal solid wall insulation	£3,000	£5,100	£216	£242
Wallpaper insulation.	£1,660	£3,700	£180	£227

Table 7: Assumed breakdown of solid wall insulation costs by social and non social sector

Previous assumptions for share of costs of solid wall insulation

Carbon saving measure	Cost distribution for measures installed in social housing						Cost distribution for measures installed in non-social housing					
	SHP cost proportion		Supplier cost proportion		Householder cost proportion		SHP cost proportion		Supplier cost proportion		Householder cost proportion	
	PG	non-PG	PG	non-PG	PG	non-PG	PG	non-PG	PG	non-PG	PG	non-PG
SWI external	20%	20%	80.0 %	80.0 %	0.0%	0.0%	0%	0%	100.0 %	**20.0%**	0.0 %	80.0%
SWI internal	25%	25%	75.0 %	75.0 %	0.0%	0.0%	0%	0%	100.0 %	**20.0%**	0.0 %	80.0%
Insulated wallpaper	25%	25%	75.0 %	75.0 %	0.0%	0.0%	0%	0%	100.0 %	**20.0%**	0.0 %	80.0%

New assumptions for share of costs of solid wall insulation

Carbon saving measure	Cost distribution for measures installed in social housing						Cost distribution for measures installed in non-social housing					
	SHP cost proportion		Supplier cost proportion		Householder cost proportion		SHP cost proportion		Supplier cost proportion		Householder cost proportion	
	PG	non-PG	PG	non-PG	PG	non-PG	PG	non-PG	PG	non-PG	PG	non-PG
SWI external	75%	75%	25.0 %	25.0 %	0.0%	0.0 %	0%	0%	100.0 %	**20.0%**	0.0%	80.0%
SWI internal	75%	75%	25.0 %	25.0 %	0.0%	0.0 %	0%	0%	100.0 %	**20.0%**	0.0%	80.0%
Insulated wallpaper	25%	25%	75.0 %	75.0 %	0.0%	0.0 %	0%	0%	100.0 %	**20.0%**	0.0%	80.0%

Table 8: New IAG guidelines on estimating cost-effectiveness

A number of changes in analytical procedure have been made since the original CERT explanatory memorandum. These are summarised below.

	Original CERT analysis for Impact Assessment (January 2008)	**Consultation on CERT+20% extension**	**Final impact assessment**
Benefits from fuel savings	Valued at retail price	Valued at benefit to the UK	Valued at benefit to the UK
Benefits from comfort	Valued at retail price	Valued at retail price	Valued at retail price
Shadow price of carbon	Applied to savings in both the traded and non-traded sectors	Applied to non-traded sector only (gas, oil, coal)	Applied to non-traded sector only (gas, oil, coal)
Avoided purchase of EU-ETS allowances	Not calculated	Applied to traded sector (electricity)	Applied to traded sector (electricity)
Avoided air pollution benefits	Not calculated	Not calculated	Included
Avoided renewables costs to meet targets	Not calculated	Included	Not calculated