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Carbon Emissions Reduction Target 2008-2011 Market Transformation Action

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Target audience: CERT obligated electricity and gas suppliers, organisations working with CERT obligated suppliers, environmental bodies, government departments and other interested stakeholders.

Overview:

This document sets out how Ofgem will assess whether a proposed activity is market transformation action under the Electricity and Gas (Carbon Emissions Reduction) Order 2008. Under the definition of market transformation the Authority must not approve any similar qualifying action to that used in EEC 2002-2005 that does not achieve a significantly greater reduction in carbon emissions as market transformation action. This document sets out the thresholds over which the carbon emissions reduction of an action will be considered by Ofgem to have met this 'significantly greater than' test.

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The Carbon Emissions Reduction Target (CERT), previously the Energy Efficiency Commitment (EEC2) is the government's main policy instrument for reducing carbon emissions from existing households. CERT is due to run from 2008-2011 and will require certain energy suppliers to comply with a carbon emission reduction target. To encourage the suppliers to promote novel actions under their activity the Government has provided in the Order an incentive for market transformation action - measures that were not promoted under the Electricity and Gas (Energy Efficiency Obligations) Order 2001. This incentive will take the form of an increase in the reduction in carbon emissions attributed to that action.

This document sets out how Ofgem will fulfill its duties, under the Electricity and Gas (Carbon Emissions Reduction) Order 2008, in administering market transformation in the CERT 2008-2011.

- The Electricity and Gas (Carbon Emissions Reduction) Order 2008 http://www.opsi.gov.uk
- The explanatory memorandum for the Order: http://www.opsi.gov.uk/si/si2008/draft/em/ukdsiem_9780110805306_en.pdf
- The CERT Technical Guidance Manual (forthcoming)
- The CERT Supplier Guidance http://www.ofgem.gov.uk
- Defra's Final energy and carbon saving scores for the EEC 2008-11 illustrative mix - published March 07 http://www.defra.gov.uk/environment/climatechange/uk/household/eec/pdf/illustrativemix-final2007.pdf

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Summary

The Electricity and Gas (Carbon Emissions Reduction) Order 2008 ('the Order') came into force on 31 January 2008 and established the carbon emissions reduction obligations for certain gas suppliers and electricity suppliers for the period 1 April 2008 to 31 March 2011. The Order provides an incentive to suppliers to achieve reductions in carbon emissions by way, in part, of market transformation actions. The incentive is the accreditation of additional improvements in carbon emissions to count towards the supplier's carbon emissions reduction obligation (established for it by the Authority under the Order).

This guidance paper outlines how Ofgem will assess whether a proposed activity is market transformation action under the Order. Ofgem considers that requiring a specified standard to be exceeded or a specified percentage improvement for each similar action to that used in the Energy Efficiency Commitment (EEC) 2002-2005 is consistent with the requirements of the Order and provides the greatest certainty to suppliers and manufacturers. This document therefore provides these standards.

Defra's intention is that market transformation action would operate in a similar way to innovative action in the EEC 2005-2008. This document therefore updates the EEC 2005-2008 Innovative Action guidance. It does not provide guidance on any other aspect of the CERT, notably not demonstration action and Priority Group flexibility action. Guidance for these actions is provided for in Ofgem's main CERT guidance document.

1. Introduction

1.1. The Electricity and Gas (Carbon Emissions Reduction) Order 2008 ('the Order')[1] came into force on 31st January 2008. It follows on from the Electricity and Gas (Energy Efficiency Obligations) Order 2004 ("the EEC 2005-2008"), which established energy efficiency obligations for certain gas suppliers and electricity suppliers for the period 1 April 2005 to 31 March 2008.

1.2. The Gas and Electricity Markets Authority, referred to as Ofgem throughout this document, is required to carry out certain functions under the Order. Details of how Ofgem intends to carry out these functions are set out in the Carbon Emissions Reduction Target 2008-2011 Supplier Guidance[2].

1.3. Ofgem is required to apportion an overall target of 154 million lifetime tonnes of carbon dioxide between obligated gas and electricity supply licensees. Those licensees are required to meet this carbon obligation by achieving carbon emissions reductions attributable to qualifying actions. At least 40 per cent of each supplier's carbon emissions reduction obligation must be achieved in relation to the Priority Group, which consists of domestic consumers receiving certain benefits, tax credits where the consumer's income is below £15,592 or consumers who are over 70 years old.

Quantifying reductions in carbon emissions

1.4. To quantify a reduction in carbon emissions, for all standard actions apart from fuel switching actions, Ofgem applies the same four step process used by Defra to establish the reduction in carbon emissions for the measures outlined in the illustrative mix used to set the overall carbon emissions reduction target (CER target).

a. First, an annual energy saving (kWh/a) is determined for each action. This figure represents the energy saving achieved by the action in a one year period.
b. Second, the appropriate carbon dioxide coefficient, as detailed in the Order, is applied to the annual energy saving. These coefficients reflect the different carbon content of the different fuels.
c. Third, adjustments are made to the reduction in carbon emissions that make an allowance for the latest physical monitoring or the heat replacement effect.
d. Finally, the reduction in carbon emissions is multiplied by the estimated lifetime of the action to calculate the lifetime carbon emissions reduction.

[1] SI 2008/188
[2] Carbon Emissions Reduction Target 2008-2011 Supplier Guidance, January 2008, available from www.ofgem.gov.uk .

1.5. For example, with insulation actions, the annual energy saving for qualifying action is the difference in energy consumption before and after installation e.g. the energy required to heat a home to the same level before and after insulation has been installed. For measures which are installed in the physical fabric of a property (i.e. insulation and heating measures) the type of property and its number of bedrooms are relevant factors.

1.6. For fuel switching measures the annual carbon emissions reduction is determined by subtracting the annual carbon emissions of the domestic property after the new heating system is installed from the carbon emissions prior to the new heating system being installed. This carbon emissions reduction is then multiplied by the lifetime of the measure to give the lifetime tonnes of carbon dioxide.

1.7. A spreadsheet ("the CERT Scheme Spreadsheet") has been developed by Ofgem to calculate automatically the lifetime tonnes of carbon dioxide attributable to each action type for the purpose of the Order.

1.8. Defra consulted on its proposals for the Order in May 2007[3]. In this document it stated that it intended to maintain the incentive for Innovative Actions to be carried out by suppliers, but renamed it market transformation action. In the Order the definition for market transformation action has been extended to include all solid wall insulation and all micro CHP units with a maximum capacity of less than 50kWe[4] as well as covering products which could have been captured by the innovative action definition in the EEC2 Order. The government has therefore left the design of the market transformation action broadly unchanged from the innovative action mechanism in EEC 2005-2008.

1.9. The Order includes an incentive for suppliers to carry out market transformation action. This document provides guidance on what Ofgem considers to be market transformation action. All other aspects of the Order are covered in Ofgem's Supplier Guidance.

[3] Carbon Emissions Reduction Target April 208 to March 2011, Consultation Proposals, Defra, May 2007
[4] Where they will achieve to a reduction in carbon emissions.

2. Background

Chapter Summary

This chapter outlines how Ofgem has interpreted the market transformation action provision in the CERT Order.

2.1. Market transformation action is defined in article 2(3)(b) of the Order as:

> "an action which is -
>
> (i) the promotion of solid wall insulation or micro-cogeneration units where such action will achieve a reduction in carbon emissions; or
>
> (ii) any other action which will achieve a reduction in carbon emissions but which the Authority did not approve as a qualifying action under the 2001 Order;"

2.2. Article 12(3) of the Order states that:

> "the Authority must not approve an action as a market transformation action where-
>
> (a) there exists a similar action to the type of action intended to be promoted; and
>
> (b) the action to be promoted does not achieve a significantly greater reduction in carbon emissions than that similar action."

2.3. However, article 12(4) states that article 12(3) "does not apply to the promotion of solid wall insulation or micro-cogeneration units".

2.4. Where a supplier carries out a market transformation action, Ofgem is required to determine the reduction in carbon emissions to be attributed to that action. Where no more than 6 per cent of a supplier's carbon emissions reduction obligation has been met through market transformation action or demonstration action Ofgem must increase the reduction in carbon emissions attributed to that action by 50 per cent. The 50 per cent increase must be applied after calculating whether 6 per cent of the supplier's obligation has been met through these types of action. Where at least 2 per cent of a supplier's obligation is achieved by the promotion of microgeneration measures approved as market transformation action, the 6 per cent limit above is increased to 8 per cent.

2.5. Article 2(3)(b)(i) of the Order provides that the promotion of solid wall insulation or micro-cogeneration units where such action will achieve a reduction in carbon emissions is a market transformation action.

2.6. In addition, article 2(3)(b)(ii) provides that an action which will achieve a reduction in carbon emissions but which Ofgem did not determine as a qualifying action under the Electricity and Gas (Energy Efficiency Obligations) Order 2001 (the "EEC 2002-2005") may be a market transformation action, as long it is not precluded by article 12(3).

2.7. Article 12(3) of the Order states that the Authority must not approve an action as a market transformation action where a similar qualifying action exists and the action does not achieve a significantly greater reduction in carbon emissions than that similar action ("the significantly greater than test").

2.8. It follows that if a measure was not determined as a qualifying action under the EEC 2002–2005, the technology associated with the measure in question will be a market transformation if it achieves a reduction in carbon emissions.

2.9. Between EEC 2002-2005 and CERT the methodology for accrediting activity against a supplier's obligation has been changed. In EEC 2002-2005 suppliers were accredited with a lifetime discounted energy saving while in the CERT programme the suppliers are accredited with a lifetime carbon dioxide emissions reduction. There have also been a number of changes to the assumptions used to evaluate the energy savings/carbon emissions reduction from measures. However, to evaluate the whether there is going to be a significantly greater reduction in carbon emissions between a 'similar action' and the action being promoted under the Order it is necessary to have a consistent approach to evaluating the carbon emissions reductions for both actions.

2.10. For market transformation action in the CERT programme Ofgem considers that it is appropriate to evaluate the carbon emissions reduction achieved by the baseline measure in EEC 2002-2005 under the assumptions and carbon calculation methodology used to evaluate measures in the CERT programme. This carbon emissions reduction should be compared to the carbon emissions reduction of the new measure that the supplier seeks to promote as a market transformation action. If the carbon emissions reduction of the measure being promoted by the supplier is significantly greater than that achieved by the similar action in EEC 2002-2005 then the new action can be considered market transformation action. It is not appropriate to consider the accreditation of measures under the EEC 2002-2005 methodology and separately under the CERT methodology as this could lead to the approval or not of measures purely based on the changes in the way measures are accredited.

2.11. In this document Ofgem has, where possible, stated the threshold over which the carbon emissions reduction of an action will be considered by Ofgem to have met the significantly greater than test, (enabling the action to be a market transformation action). Ofgem considers that this is consistent with the requirements of the Order and provides the greatest certainty to suppliers and manufacturers. However, this is a developing area and, where actions are not covered in this guidance or there are other reasons why it is appropriate to do so, Ofgem will consider whether they can be said to have met the significantly greater than test.

2.12. Details of thresholds or reasons why a significantly greater reduction is not likely to be achievable in the case of certain actions are provided in chapter 3. Ofgem considers that, as a general guideline, in most cases a carbon emissions reduction of 20 per cent above the standard achieved by a similar action determined as qualifying action under the EEC 2002–2005 represent a significantly greater reduction for the purpose of assessing whether an action is a market transformation action; this is consistent with EEC2. Ofgem's underlying principle behind setting the thresholds given in this document is that they should be challenging and demonstrate a considerably larger reduction in carbon emissions than that achieved by similar actions under the EEC 2002-2005. For some actions there is more scope for improvement such that a larger reduction in carbon emissions in percentage terms will be considered "significantly greater" by Ofgem. For other actions, as improvements under the EEC 2002-2005 led to such efficient products, it is unlikely that any further reduction in carbon emissions will be considered a significantly greater reduction.

2.13. Appendix 1 contains a table detailing qualifying actions taken under the EEC 2002-2005, the measures used in respect of those actions and the key factors for determining the reduction in carbon emissions for each action.

2.14. As indicated above, measures under EEC 2002-2005 were accredited based on improvements in energy efficiency measured in lifetime discounted energy savings. In the CERT the suppliers will be accredited with lifetime reductions in carbon emissions. To avoid confusion between these two terms in this document we have referred to reductions in carbon emissions, even when referring to the energy savings as determined under EEC 2002-2005, unless the context requires otherwise.

3. Market transformation action

Chapter Summary

This section details the level of reduction Ofgem considers would represent a significantly greater reduction in carbon emissions compared to a similar action under the EEC 2002–2005 for each action type, for the purpose of paragraph 12(3)(b) of the CERT Order.

Eligibility

3.1. Article 2(3)(b)(ii) provides that for an action to be a market transformation action it must achieve a reduction in carbon emissions by an action that was not approved as a qualifying action under the EEC 2002-2005. If the criteria in article 12(3)(a) is also met, it must also pass the significantly greater than test provided in article 12(3)(b).

3.2. The novelty of the material or technology employed is essential for an action to be a market transformation action. Appendix 1 details the materials and technologies used in respect of qualifying actions under the EEC 2002-2005 and these are the comparators for similar action under market transformation action. An action which uses any of these materials and technologies can not be considered to be a market transformation action.

3.3. Where an action is different to the actions used under the EEC 2002-2005, but is of a similar type of action, the reduction in carbon emissions must be significantly greater than that achieved by the similar action. Ofgem considers that for actions to be similar they should have the same application, function and effect in domestic premises. For example, a new type of cavity wall insulation material would be a similar action to cavity wall insulation that was installed under the EEC 2002-2005.

3.4. Where there is no similar action, and the action was not a qualifying action under the EEC 2002-2005, an action will be classed as a market transformation action if it achieves a reduction in carbon emissions compared to the energy consumption of the sales weighted average product of that type, or to the energy consumption of the product of that type complying with an applicable legal minimum standard (e.g. where the Building Regulations apply to the product). This is the same additionality requirement we apply to all measures used in the CERT programme.

3.5. The determination of the reduction in carbon emissions for the purpose of establishing whether a supplier has met its target will be based on the methodology used to derive the carbon emissions reduction given in the CERT Scheme Spreadsheet for the CERT 2008-2011. The 50 per cent uplift, if applicable, will be applied to the reduction in carbon emissions.

3.6. Ofgem is aware that certain products were promoted, but not notified in a completion report, under the EEC 2002-2005. Such products may be notified under the Order and may be a market transformation action if the relevant criteria are met.

3.7. For the purposes of the Order, market transformation action is a qualifying action. Ofgem can only determine the reduction in carbon emissions, and any uplift, once it has received notification, the action has been approved and the action in question has been completed.

3.8. The paragraphs below indicate the threshold that Ofgem considers must be met for a reduction in carbon emissions to be considered to be a significantly greater reduction compared to the greatest reduction in carbon emissions achieved by a similar action under the EEC 2002-2005.

Significantly greater reduction

3.9. There is a natural variation in the reduction in carbon emissions achieved by different products due to different thermal characteristics of properties and usage patterns by consumers. These variations are accounted for in the average performance of products that are used in the carbon emissions reduction calculations carried out by Ofgem. Therefore, an increase in the reduction in carbon emissions cannot be considered "significantly greater" where that level of improvement for each action was taken into account by Ofgem for the purpose of determining the improvement in energy efficiency in EEC 2002-2005.

Loft insulation

3.10. Loft insulation promoted by suppliers may be either professionally installed or for DIY installation.

3.11. The reduction in carbon emissions derived under the EEC 2002-2005 was based on loft insulation being installed so that the loft achieved a U-value of 0.16 W/m^2K. The scale of the reduction in carbon emissions attributed to loft insulation was less for homes that already had some insulation, although the thermal characteristic of the loft after the insulation had been installed was broadly similar.

3.12. Even if a new technology were employed to insulate lofts, the remaining heat loss through the loft is small compared to the reduction in carbon emissions as a result of insulation. There is very little scope for decreasing the U-value of a loft, and consequently for improving the reduction in carbon emissions over the standard used in the EEC 2002-2005. Accordingly, Ofgem considers it very unlikely that it will be possible to demonstrate a significantly greater reduction in carbon emissions with respect to loft insulation.

Cavity wall insulation

3.13. The reduction in carbon emissions for cavity wall insulation derived under the EEC 2002-2005 was based on reducing the U-value of an external wall of a pre-1976 home from 1.44 W/ m^2K to 0.48 W/ m^2K or improving the U-value of an external wall of post-1976 home from 1.0 W/ m^2K to 0.42 W/ m^2K.

3.14. While the change in the thermal characteristics of each type of property is different, the thermal characteristics of the walls of the premises post insulation are quite similar, a U-value of 0.48 W/m^2K for the pre-76 property and 0.42 W/m^2K for the post-76 property. It is on this basis that Ofgem considers it appropriate to set a single threshold for cavity wall insulation for suppliers to demonstrate a significantly greater reduction in carbon emissions.

3.15. In the CERT programme, Ofgem will accredit cavity wall insulation measures based on the average property type. In addition, the carbon emissions reduction calculation for cavity wall insulation in the CERT programme makes an allowance for consumers taking part of the carbon emissions reduction as increased warmth (comfort taking), whereas in EEC 2002-2005 it did not. These changes between the EEC 2002-2005 methodology and the CERT methodology for evaluating a reduction in carbon emissions need to be reflected in the standards for the significantly greater test for market transformation activity.

3.16. The determination of a reduction in carbon emissions for cavity wall insulation under the EEC 2002-2005 was based on the assumptions that an unfilled cavity is of a fixed width and that the material used has a lambda, or thermal conductivity,[5] of 0.04 W/mK. These assumptions remain the same for the purpose of accreditation in the CERT 2008-2011. When comparing products, all other things being equal, a lower lambda value will equate to greater reduction in carbon emissions.

3.17. Ofgem considers that a 20 per cent reduction in carbon emissions above the standard achieved under the EEC 2002-2005 for cavity wall insulation (based on the CERT methodology of evaluation) would be suitable to demonstrate a significantly greater reduction in carbon emissions. A cavity wall insulated with a product that has a lambda of 0.024 W/mK would meet this requirement. This lambda is marginally higher than that used in EEC 2005-2008 and consequently should be easier to achieve.

3.18. The lambda value of new products should be verified by way of an independent third party quality assurance scheme e.g. the British Board of Agrément or BRE Certification.

[5] The thermal conductivity is the measure of the thermal properties of a product. A low value demonstrates that the product conducts less heat and is a good insulator.

Draught-proofing

3.19. The carbon emissions reduction attributed to draught proofing in the EEC 2002-2005 was based on reducing the air infiltration of a property by 0.15 air changes per hour, which can be approximately expressed as 0.15 $m^3/h/m^2$. The potential for a reduction in carbon emissions from draught-proofing windows and doors is quite low as, in general, only a small proportion of the heat loss from a home is by these means.

3.20. Ofgem considers that to be a market transformation action for draught proofing, any new technology should be expected consistently to reduce the air permeability result of a pressurisation test from around 11 $m^3/h/m^2$ at 50 Pascals, a typical level, to less than 7 $m^3/h/m^2$ at 50 Pascals.

3.21. The performance of any product will need to be independently verified and the results will need to be submitted to Ofgem. To ensure that reductions in carbon emissions for draught-proofing are realised, suppliers need to ensure that draught-proofing products are targeted at homes that are expected to have a high degree of air infiltration.

Solid wall insulation

3.22. In the EEC 2005-2008 Innovative Action guidance document there were sections for both external and internal solid wall insulation. These have been removed for this document as these measures have been explicitly defined as market transformation action, where they lead to a reduction in carbon emissions, for the purposes of the CERT Order.

Hot water tank insulation

3.23. The carbon emissions reduction attributed to tank jackets is based on a comparison of the market average thickness of insulation and the thickness of the jackets being installed.

3.24. Given the fact that tank jackets currently installed allow for very little heat loss, Ofgem considers that there is no possibility of action in respect of the installation of tank jackets resulting in a significantly greater reduction in carbon emissions.

Radiator panels

3.25. Radiator panels installed for EEC 2002-2005 purposes were all of a saw tooth design with a reflective surface. The reduction in carbon emissions resulting from installation of certain radiator panels were increased during the EEC 2002-2005 period due to a change to the methodology for the calculation of the energy savings. For the avoidance of doubt, any increase in the reduction in carbon emissions resulting from a change to the methodology for calculating a reduction in carbon

emissions is irrelevant to the question of whether an action is a market transformation action.

3.26. In the absence of any further information on the radiator panel products that are being developed, Ofgem considers that to meet the significantly greater than test a 20 per cent increase in the reduction in carbon emissions attributed to radiator panels above that achieved by radiator panels under EEC 2002-2005 should be achieved.

Lighting

3.27. The lighting products accredited in the EEC 2002-2005 were based on compact fluorescent (CFL) technology only.

3.28. The carbon emissions reduction from the use of low energy lighting are dependent on the difference between the wattage of the CFL promoted and the wattage of the GLS equivalent being replaced (the usage for both is assumed to be the same). Monitoring research carried out under the EESoP 3[6] programme suggests that the average CFL installed saves 78 per cent of the electricity demand for that fitting. Energy savings attributed under the EEC 2002-2005 and the CERT 2008-2011 reflect this.

3.29. There are a number of alternative lighting products being brought to the market some of which are not quite as energy efficient as a CFL while others are more efficient. Given that there is a better technology being brought to the market Ofgem considers that lighting measures should only be considered to be market transformation actions under the Order if they lead to a significantly greater reduction in carbon emissions compared to CFLs.

3.30. Ofgem considers that the reduction compared to lighting actions under the EEC 2002 – 2005 should be 10 per cent more, i.e. on a like for like basis the new lamp would lead to an 86 per cent reduction in the electricity demand for that light fitting.

3.31. It is worth noting that Ofgem has capped the lifetime of lighting action for the purpose of attribution of energy savings for CFLs[7] under the Order, in line with Defra's target setting model. As a result, it is not possible to meet the significantly greater reduction in carbon emissions test through an increased lifetime over that taken into account in the CERT carbon reduction calculation.

[6] Energy Efficiency Standard of Performance 3, the supplier energy efficiency programme that ran between April 2000 and March 2002.
[7] This is necessary to eliminate the potential for the longest lifetime CFLs being promoted over other CFLs without due consideration for consumers' aesthetic preferences

Heating measures that provide both heat and hot water for domestic premises

3.32. The market for boilers has almost been completely transformed and in most cases it is not appropriate to accredit a reduction in carbon emissions to A-rated boilers. However, it is possible that suppliers could still meet the significantly greater than test for heating measures.

3.33. Under the EEC 2002-2005, suppliers proposed a number of different heating and hot water measures although only condensing gas boilers were attributed an energy saving. The reduction in carbon emissions attributed to boilers was dependent on the efficiency of the boiler installed compared to the efficiency of a boiler complying with the minimum standard under the Building Regulations, roughly the difference in energy consumption between a property with a 78 per cent efficient boiler and a property with a 90 per cent efficient boiler.

3.34. The boilers[8] installed for the purpose of the EEC 2002-2005 are amongst the most efficient possible and, as such, they are approaching the limits of the seasonal efficiency that can be calculated for boilers based on the SEDBUK[9] database equations.[10] Consequently, the reductions under the EEC 2002–2005 are almost the highest possible for boilers.

3.35. The reduction in carbon emissions achieved by the most efficient upgrades above the Building Regulations minimum standard for gas, LPG and oil under the EEC 2002-2005 is set out in the table below. In the absence of any further information, Ofgem considers that a 20 per cent increase in the reduction in carbon emissions above the standard achieved under the EEC 2002-2005 (also set out in the table) would be enough to demonstrate a significantly greater reduction in carbon emissions. In the case of gas or LPG fired boilers, Ofgem notes that this threshold is above the efficiency threshold attainable on the SEDBUK database and it is therefore very unlikely that suppliers will be able to claim for the uplift for innovative action for these measures. Additionally, the BRE have advised that the SEDBUK methodology for evaluating the efficiency of oil-fired boilers at high efficiencies needs consideration and might not be robust. For this reason, in the CERT oil-fired boilers cannot be a qualifying action and hence cannot be claimed under market transformation action. However, some improvements boiler efficiency cannot be measured by the SEDBUK database and if these achieve a significantly greater reduction in carbon emissions they could be considered market transformation action.

3.36. It is important to note that the minimum standard for boilers in the Building Regulations has changed since the beginning of EEC 2002-2005. In carrying out the

[8] For the avoidance of doubt this does not include MCHP.
[9] Seasonal Efficiency of Domestic Boilers in the UK.
[10] The basis on which the efficiency of all boilers is calculated.

calculation for the reduction in carbon emissions for the significantly greater than test for market transformation action, Ofgem will use as a base the minimum boiler efficiency that was required under the amended Building Regulations.

Table 1: Boiler efficiencies required to demonstrate a significantly greater reduction in carbon emissions than the improvement in energy efficiency achieved in the EEC 2002-2005

	Building Regulations standard to March 2005	Maximum efficiency of boilers installed under the EEC 2002-2005	Efficiency required to demonstrate a significantly greater improvement in energy efficiency
Gas	78 per cent	91.3 per cent	94 per cent
LPG	80 per cent	92.6 per cent	95.1 per cent
Oil	85 per cent	95 per cent	NA

3.37. Other heating and hot water products were installed for EEC 2002-2005 purposes and schemes where the heating fuel has been switched to gas from a more carbon intensive fuel have been promoted.

3.38. The carbon emissions reduction for fuel switching is based on the difference in the fuel-standardised energy consumption of a house heated by one fuel as opposed to another fuel with a lower carbon content. The carbon emissions reduction accredited to a supplier is based on it installing, for instance, a gas-fired boiler to the required standard under the Building Regulations. Given that the basis of these calculations is the minimum legal standard, Ofgem proposes that it will not be possible to consider fuel switching innovative action as there is no potential for improvement beyond that required by law.

3.39. No other heating or hot water measures were accredited under the EEC 2002-2005. However, there are a number that are near to the market that will lead to a reduction in carbon emissions. Ofgem considers that the most appropriate way to determine whether these measures should be considered market transformation actions is to assess them based on the comparison of the reduction in carbon emissions that results from the service they provide. For instance, solar water heating reduces energy demand for the provision of hot water only and the reduction in carbon emissions would be assessed on the improvement achieved in water heating compared with that achieved by the most efficient boiler used in the EEC 2002-2005. Ground source heat pumps, however, can replace the total heat and hot water demand for a domestic premises and the reduction in carbon emissions would be assessed on this basis. Ofgem considers that a 20 per cent increase in the carbon emissions reduction for heating and/or hot water measures would be suitable to demonstrate a significantly greater reduction in carbon emissions.

3.40. The carbon emissions reduction depends on the method of heating and hot water provision before the installation of the alternative product. The reduction in

carbon emissions achieved is highly dependent on the heating fuel of the property prior to installation.

Heating controls

3.41. A variety of different heating control products were promoted by suppliers under the EEC 2002-2005. The energy savings from heating controls depend on whether the control is installed with a boiler or not and the type of controls that are already present in the property. Where a boiler has been replaced there will only be a reduction in carbon emissions if the requirements of the Building Regulations are exceeded.

3.42. Evaluating the energy savings from the different heating controls is difficult because of the small change in the heat balance of a domestic property that occurs as a result of their use. A reduction in carbon emissions that arises from heating controls needs to be evaluated using a thermal simulation model.

3.43. Ofgem considers that a 20 per cent reduction in carbon emissions from heating controls compared with the controls that have been installed under the EEC 2002-2005 would demonstrate a significantly greater reduction in carbon emissions. This reduction should, in the case of heating controls installed with a new boiler, be a reduction in carbon emissions of 20 per cent more than the standard achieved by a system controlled with the most efficient heating controls installed under the EEC 2002-2005. In both cases the reduction in carbon emissions are measured by comparing the heating controls against a heating system installed to the Building Regulations minimum. In the case of heating controls being installed without a boiler, the reduction in carbon emissions should be a 20 per cent more than the reduction in carbon emissions of an uncontrolled heating system compared to a system controlled with the most efficient heating controls installed under the EEC 2002-2005.

3.44. Given below are the types of heating controls that were installed under the EEC 2002-2005.

- room thermostat
- boiler interlock
- delayed start functionality
- weather or load compensation
- time and temperature zone control, and
- thermostatic radiator valves (TRVs).

Heat recovery ventilation

3.45. The reduction in carbon emissions attributable for heat recovery ventilation for a single room is dependent on the power of the extractor fan and the effectiveness of the heat exchanger in the unit. There was only one type of heat recovery unit installed under the EEC 2002-2005. The heat recovered per kWh of electricity used by the unit was 8.5 kWh. Ofgem considers that a 20 per cent increase in carbon

emissions reduction at the same operating conditions, 1 hour boost and 23 hours trickle, would be suitable to demonstrate a significantly greater reduction in carbon emissions for these units. This would be achieved by a new heat recovery unit that recovered 10.2 kWh of heat per kWh of electricity consumed by the unit.

Cold appliances

3.46. The reduction in carbon emissions attributable to a cold appliance, i.e. fridges, freezers and fridge freezers, is dependent on the type of appliance promoted and the way it is delivered to the consumer (known as "the delivery route"). There are three delivery routes for cold appliance schemes: incentive, trade-in and fridgesaver schemes. Both the delivery mechanism and the particulars of the product dictate the reduction in carbon emissions that will result from the action.

3.47. In the case of incentive schemes, consumers are encouraged to purchase a more efficient appliance than they might have purchased otherwise. The reduction in carbon emissions for incentive schemes are based on the difference between the sales weighted average energy consumption of similar appliances and the consumption of the product being promoted.

3.48. In the case of trade-in schemes, consumers are able to trade in a working appliance for a more efficient alternative. In this case, the reduction in carbon emissions is two-fold. Firstly, by removing the existing inefficient appliance from the market, higher energy consumption is avoided. Secondly, a more efficient appliance is purchased than would normally have been the case.

3.49. Fridgesaver schemes operate in a similar way to trade in schemes but are limited to Priority Group consumers with an appliance in bad condition. The reduction in carbon emissions are again higher for the same two-fold reason as that given for trade-in schemes.

3.50. All of the carbon emissions reduction claimed for cold appliances under the EEC 2002-2005 were for the promotion of A-rated appliances. Since the EEC 2002-2005 the market for cold appliances has been transformed and in all cases, except for chest freezers, it is no longer appropriate to determine a reduction in carbon emissions for A-rated appliances. As it is no longer appropriate to determine the reduction in carbon emissions for A-rated appliances it is not possible to calculate the reduction required to demonstrate a significantly greater reduction in carbon emissions for cold appliances. However, on 1 July 2004, A+ and A++ ratings were introduced. None were accredited as qualifying action in the EEC 2002-2005 and to date the market penetration for these products is very low. Ofgem considers, therefore, that to demonstrate a significantly greater reduction in carbon emissions for cold appliances suppliers should be required to promote A+ and/or A++ appliances.

3.51. As with other market transformation actions, the uplift will apply to the reduction in carbon emissions that are determined for the action. In respect of cold

appliances, the action is the promotion of A+ or A++ appliances through any one of the three delivery routes outlined above.

Wet appliances

3.52. The market for wet appliances is now almost wholly dominated by the appliances with the highest efficiency rating. As these appliances cannot be attributed a reduction in carbon emissions they are not a qualifying action in the CERT.

Washing machines

3.53. It may, however, be possible for suppliers to have washing machines accredited as market transformation actions if they lead to a significantly greater reduction in carbon emissions over the products sold in the highest efficiency category. It has been suggested that a new A+ rating might be introduced for washing machines and this would represent a 40 per cent improvement over the A-rated standard achieved in the EEC 2002-2005; the energy consumption per wash would fall from 0.19 kWh/kg of wash to 0.17 kWh/kg of wash. Ofgem considers that this threshold should be used to demonstrate a significantly greater reduction in carbon emissions for washing machines. While this is higher than the standards for some of the other measures it reflects the reduction in carbon emissions that have been seen in washing machines since the EEC 2002-2005 was set up.

Dishwashers

3.54. Suggesting a standard for dishwashers is also difficult because the appliances delivered by the suppliers are already in the highest energy efficiency rating. There are no proposals to introduce an A+ rated category for dishwashers as there is little evidence that further carbon savings are attainable. Accordingly, Ofgem considers it very unlikely that it will be possible to demonstrate a reduction in carbon emissions with respect to dishwashers.

Jug kettles

3.55. Under the EEC 2002-2005 some suppliers distributed jug kettles. The reduction in carbon emissions attributed to kettles was based on the requirement that certain delivery criteria were met. As jug kettles are now the market norm they cannot be considered qualifying action under the CERT programme.

3.56. However, Ofgem is aware that other kettle designs are being brought to the market. If these can demonstrate a 20 per cent reduction in carbon emissions over that achieved by the kettles in the EEC 2002-2005 under the same delivery criteria, then they will be considered as market transformation actions.

Community based combined heat and power

3.57. Combined heat and power involves the simultaneous generation of useful heat and electricity. Because of the resulting high operational efficiencies, this type of technology is considered energy efficient. The Order states that CHP with a capacity of less than 50kWe is market transformation action if it leads to a reduction in carbon emissions.

3.58. There were no large scale CHP (over 50kWe) schemes determined as a qualifying action under the EEC 2002-2005, accordingly there is no 'similar action' with which to compare them. Where these schemes lead to a reduction in carbon emissions they could be considered to be a market transformation action.

Community based heating schemes

3.59. Under the EEC 2002-2005, boilers used in community heating schemes, i.e. those that do not generate electricity, are amongst the most efficient boilers available. Ofgem therefore considers it unlikely that suppliers will be able to demonstrate a significantly greater reduction in carbon emissions from this type of action.

Appendices

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Appendix 1 – Qualifying action under the EEC 2002-2005

The measures listed below are the benchmark actions under EEC1.

Action determined under Article 8(1) of the Electricity and Gas (Energy Efficiency Obligations) Order 2001	**Measures used**	**Uninsulated, business as usual or legal minimum standard**	**Standard installed to under the EEC 2002-2005**	**EEC 2002-2005 energy saving derived from:**
Loft insulation	Rockwool, mineral wool, cellulose fibre, sheep's wool	U-value of 2.3 W/m^{2}K	U-value of 0.16 W/m^{2}K	Reduction in U-value to 0.16 W/m2K
Cavity wall insulation	Rockwool, mineral wool, polystyrene beads	Pre–76 properties U-value of 1.44 W/m^{2}K, Post–76 properties U-value of 1.0 W/m^{2}K	Pre–76 properties U-value of 0.48 W/m^{2}K, Post–76 properties U-value of 0.42 W/m^{2}K	Reduction in U-value to 0.48 W/m2K in pre-76 homes and 0.42 W/m^{2}K in post-76 homes
Draught proofing	Draught stripping	NA	NA	A reduction in air infiltration of 0.15 m3/h/m2
Hot water tank insulation	Installation of hot water tank insulation to 80mm	The market average insulation on a hot water tank	80 mm of insulation	Difference in energy consumption between hot water tank with market average insulation and a hot water tank with 80mm of insulation
Radiator panels	Saw tooth design with reflective surface	A radiator with no panel present	Installation of a saw tooth	Difference in household energy

Action determined under Article 8(1) of the Electricity and Gas (Energy Efficiency Obligations) Order 2001	**Measures used**	**Uninsulated, business as usual or legal minimum standard**	**Standard installed to under the EEC 2002-2005**	**EEC 2002-2005 energy saving derived from:**
			radiator panel to the area behind the radiator	consumption between a home without radiator panels and a home with radiator panels, based on the area of radiator panels installed behind radiators
Lighting	CFLs	GLS lamp	The CFL equivalent	Difference in energy consumption of a GLS lamp and a CFL equivalent
Heating measures that provide both heat and hot water for the domestic premises	Condensing gas boilers	Building Regulations minimum standard	High efficiency boilers, roughly 90 per cent efficient	Difference in energy consumption between the condensing boiler and the legal minimum standard
Heating controls	Room thermostat, delayed start thermostat, TRVs, boiler interlock, weather or load compensation and time and temperature zone control	When installed with a boiler the legal minimum standard. When installed without a boiler - no controls	A variety of different controls	Difference in energy consumption between the existing heating system and the system with the new controls
Heat recovery ventilation	Single room heat recovery extractor unit	Extractor fan without heat recovery	8.5 kWh of recovered heat per kWh of electricity used	Difference in household energy consumption between a home

Action determined under Article 8(1) of the Electricity and Gas (Energy Efficiency Obligations) Order 2001	**Measures used**	**Uninsulated, business as usual or legal minimum standard**	**Standard installed to under the EEC 2002-2005**	**EEC 2002-2005 energy saving derived from:**
			by the unit	with an extractor fan without heat recovery and home with an extractor fan with heat recovery
Cold appliances	A rated appliances	Sales weighted average consumption	A rated	Difference between the sales weighted average consumption and the A-rated model
Washing machines	A rated appliances	Sales weighted average consumption	A rated	Difference between the sales weighted average consumption and the A-rated model
Dishwashers	A rated appliances	Sales weighted average consumption	A rated	Difference between the sales weighted average consumption and the A-rated model
Jug kettles	Jug kettles	Traditional kettle that does not have a water meter	Provision of jug kettle	The difference in the consumer's energy consumption using a traditional kettle and a jug kettle.

Appendix 2 The Authority's powers and duties

1.1. Ofgem is the Office of Gas and Electricity Markets which supports the Gas and Electricity Markets Authority ("the Authority"), the regulator of the gas and electricity industries in Great Britain. This Appendix summarises the primary powers and duties of the Authority. It is not comprehensive and is not a substitute to reference to the relevant legal instruments (including, but not limited to, those referred to below).

1.2. The Authority's powers and duties are largely provided for in statute, principally the Gas Act 1986, the Electricity Act 1989, the Utilities Act 2000, the Competition Act 1998, the Enterprise Act 2002 and the Energy Act 2004, as well as arising from directly effective European Community legislation. References to the Gas Act and the Electricity Act in this Appendix are to Part 1 of each of those Acts.[11]

1.3. Duties and functions relating to gas are set out in the Gas Act and those relating to electricity are set out in the Electricity Act. This Appendix must be read accordingly[12].

1.4. The Authority's principal objective when carrying out certain of its functions under each of the Gas Act and the Electricity Act is to protect the interests of consumers, present and future, wherever appropriate by promoting effective competition between persons engaged in, or in commercial activities connected with, the shipping, transportation or supply of gas conveyed through pipes, and the generation, transmission, distribution or supply of electricity or the provision or use of electricity interconnectors.

1.5. The Authority must when carrying out those functions have regard to:

- The need to secure that, so far as it is economical to meet them, all reasonable demands in Great Britain for gas conveyed through pipes are met
- The need to secure that all reasonable demands for electricity are met
- The need to secure that licence holders are able to finance the activities which are the subject of obligations on them[13], and
- The interests of individuals who are disabled or chronically sick, of pensionable age, with low incomes, or residing in rural areas.[14]

1.6. Subject to the above, the Authority is required to carry out the functions referred to in the manner which it considers is best calculated to:

[11] entitled "Gas Supply" and "Electricity Supply" respectively.
[12] However, in exercising a function under the Electricity Act the Authority may have regard to the interests of consumers in relation to gas conveyed through pipes and vice versa in the case of it exercising a function under the Gas Act.
[13] under the Gas Act and the Utilities Act, in the case of Gas Act functions, or the Electricity Act, the Utilities Act and certain parts of the Energy Act in the case of Electricity Act functions.
[14] The Authority may have regard to other descriptions of consumers.

- Promote efficiency and economy on the part of those licensed[15] under the relevant Act and the efficient use of gas conveyed through pipes and electricity conveyed by distribution systems or transmission systems
- Protect the public from dangers arising from the conveyance of gas through pipes or the use of gas conveyed through pipes and from the generation, transmission, distribution or supply of electricity
- Contribute to the achievement of sustainable development, and
- Secure a diverse and viable long-term energy supply.

1.7. In carrying out the functions referred to, the Authority must also have regard, to:

- The effect on the environment of activities connected with the conveyance of gas through pipes or with the generation, transmission, distribution or supply of electricity
- The principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed and any other principles that appear to it to represent the best regulatory practice, and
- Certain statutory guidance on social and environmental matters issued by the Secretary of State.

1.8. The Authority has powers under the Competition Act to investigate suspected anti-competitive activity and take action for breaches of the prohibitions in the legislation in respect of the gas and electricity sectors in Great Britain and is a designated National Competition Authority under the EC Modernisation Regulation16 and therefore part of the European Competition Network. The Authority also has concurrent powers with the Office of Fair Trading in respect of market investigation references to the Competition Commission.

[15] or persons authorised by exemptions to carry on any activity.
[16] Council Regulation (EC) 1/2003

Appendix 3 Glossary

BRE	Building Research Establishment.
Carbon obligation	Each supplier's carbon emissions reduction obligation.
CERT	Carbon Emissions Reduction Target, the name of the programme.
CER target	The overall target for carbon emissions reduction set by Defra under the Order.
CFLs	Compact Fluorescent Lamps (energy efficient light bulbs).
CHP	Combined Heat and Power.
Defra	Department for Environment, Food and Rural Affairs.
Order	The Electricity and Gas (Carbon Emissions Reduction) Order 2008.
EEC	Energy Efficiency Commitment, general reference to the EEC1 and EEC2 programmes which ran from 2002-2005 and 2005-2008, respectively.
EEC2	Energy Efficiency Commitment 2005-2008.
EESoP	Energy Efficiency Standards of Performance, the forerunner to EEC.
GLS	General Lighting Service Bulb ('normal' light bulb).
Innovative action	A collective term for demonstration action and market transformation qualifying action.
Lifetime	The estimated lifetime for measures (as set out in Defra's illustrative mix).
LPG	Liquefied Petroleum Gas.
MWth	Mega Watts thermal, i.e. of heat.
Priority Group	Defined in the Order in article 2.
Schemes	Suppliers' schemes for delivering their qualifying action.
SEDBUK	Seasonal Efficiency Database of Boilers in the United Kingdom.
Supplier	Defined in the Order in article 4(1).
TRVs	Thermostatic radiator valves.
U-value	The rate of heat flow through an object, like a wall or a window.