

**Energy Efficiency Commitment 2005-2008
Innovative Action**

Consultation document

April 2005 120/05

Summary

The Electricity and Gas (Energy Efficiency Obligations) Order 2004 ('the Order') came into force on 22 December 2005 and established energy efficiency obligations for certain gas or electricity suppliers for the period 1st April 2005 to 31st March 2008. The Order provides for an incentive to be awarded to suppliers that promote energy efficient actions which are innovative. The incentive is the accreditation of additional improvements in energy efficiency to count towards the supplier's target established under the Order.

This consultation paper addresses how Ofgem plans to assess innovative action under the Order. It is important to be aware that what is an innovative action is a question of law and fact and ultimately a matter for the courts to determine. Any opinion expressed in this document is not a statement of the law, and does not constitute legal advice to any person, so ought not to be relied on. If any person is in doubt as to their legal position they should take legal advice.

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1. Introduction

- 1.1. The Electricity and Gas (Energy Efficiency Obligations) Order 2004 ('the Order') came into force on 22 December 2004. It is intended to follow on from the Electricity and Gas (Energy Efficiency Obligations) Order 2001 ("EEC 2002-2005"), establishing energy efficiency obligations for certain gas or electricity suppliers for the period 1st April 2005 to 31st 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 Energy Efficiency Commitment 2005 – 2008 Administration Procedures, December 2004¹.
- 1.3. Ofgem is required to apportion an overall target of 130 fuel standardised, lifetime discounted terawatt hours (TWh) between obligated gas and electricity supply licensees. Those licensees are required to meet their targets by achieving improvements in energy efficiency attributable to qualifying actions. At least 50% of the total improvement attributed to the supplier's qualifying actions must be achieved in relation to the Priority Group, being domestic consumers receiving certain benefits or tax credits.
- 1.4. Defra consulted on its proposals for the Order in May 2004². In its summary of responses³ it stated that around 40% of respondents supported incentives for new energy efficient technologies, such as micro CHP. Further, it stated that there was support for the principle that new technologies should be eligible for an incentive in the early stages of market penetration.
- 1.5. With respect to domestic combined heat and power (dCHP), some respondents specifically stated that it should be eligible for an incentive subject to field trials.

¹ EEC 2005 – 2008 Administration Procedures, December 2004 is available on Ofgem's website www.ofgem.gov.uk

² The Energy Efficiency Commitment from April 2005, Consultation Proposals, Defra, May 2004

³ The Energy Efficiency Commitment from April 2005, Summary of responses, Defra, December 2004

- 1.6. Defra concluded by stating 'the Government supports the development of new energy efficient technologies and proposes an incentive for innovative products, including micro CHP units with a maximum electrical capacity of up to 50kWe.'
- 1.7. The Order included an incentive for suppliers to carry out innovative action.

2. Background

2.1 “Innovative action” is defined in article 6(3)(b) of the Order as

“a qualifying action which is not energy service action and which –

(i) achieves an improvement in energy efficiency -

(aa) by a means which was not used in respect of an action by any supplier which was determined by the Authority as a qualifying action under article 8(1)(a) of the Electricity and Gas (Energy Efficiency Obligations) Order 2001, and

(bb) which the Authority is satisfied is significantly greater than that achieved by any similar action so determined; or

(ii) achieves an improvement in energy efficiency through the use of a micro-generation unit, as defined in Article 3(m) of Directive 2004/8/EC of the European Parliament and of the Council on the promotion of cogeneration based on a useful heat demand in the internal energy market”⁴.

2.2 Where a supplier carries out an innovative action, Ofgem is required to attribute an improvement in energy efficiency to that action of 50% more than it would have otherwise, provided that the total improvement that would otherwise have been attributed to such actions is no more than 10% of that supplier’s energy efficiency target.

2.3 To quantify an improvement in energy efficiency, Ofgem applies the same three step process used by Defra to establish the overall target of 130 fuel standardised, lifetime discounted terawatt hours. Firstly, an annual energy saving (kWh/a) is determined for each action. This figure represents the improvement in energy efficiency achieved in a one year period.

⁴ Being a cogeneration unit with a maximum capacity below 50kWe.
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- 2.4 Secondly, fuel-standardisation multipliers, as detailed in the Order, are applied to the annual energy saving. The multipliers reflect the different carbon content of the fuels.
- 2.5 Finally, the annual fuel-standardised energy saving is discounted at 3.5% over the estimated lifetime of the action to calculate the lifetime-discounted, fuel standardised energy savings (GWh). The 3.5% discount factor is the standard HM Treasury discount rate and was used in Defra's target setting model.
- 2.6 For 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 will be relevant factors.
- 2.7 A spreadsheet has been developed by Ofgem to calculate automatically the lifetime discounted, fuel-standardised energy saving (kWh/a) attributable to each action type ("The EEC Scheme Spreadsheet") for the purpose of the Order. An EEC Scheme Spreadsheet was developed for the purposes of EEC 2002-2005 also and, as will be seen, the methodology for evaluating the improvement in energy efficiency for EEC 2002-2005 is relevant to establish whether an action is eligible for the innovative action uplift.
- 2.8 Suppliers indicated that they would appreciate fuller information with respect to the uplift for innovative action than was available to Ofgem at the time Ofgem's Administration Procedures were prepared. This document, therefore, addresses innovative action only. All other aspects of the EEC 2005-2008 are covered in Ofgem's Administration Procedures.
- 2.9 A supplier's action can only be qualifying action once the necessary determination has been made by Ofgem. For this reason, where references in this document are made to "actions", "qualifying actions" and "means used" in respect of products used for EEC 2002-2005 purposes, these references are illustrative rather than determinative. This document, including the appendix, must be read accordingly.

2.10 Chapter 3 of this document provides the rationale behind this document and Chapter 4 gives the timetable for comments on matters raised in it. Chapter 5 focuses on the degree of improvement in energy efficiency that Ofgem considers sufficient for different actions to be eligible for the uplift. The appendix contains a table detailing actions taken under the EEC 2002-2005, the means used in respect of those actions and the key factors for determining the improvement in energy efficiency for each action.

3. Rationale

- 3.1. Article 6(3)(b)(i)(aa) of the Order provides that a new means used in respect of a qualifying action may be innovative if it results in an improvement in energy efficiency. To be new, the means must not have been used in respect of an action determined as qualifying action under EEC 2002-2005. Appendix 1 lists means that have been proposed in respect of actions in EEC 2002-2005.
- 3.2. It follows that if an action type has not been determined as qualifying action under the EEC 2002 – 2005, the technology associated with the action in question will be a new means for the purposes of article 6(3)(b)(i)(aa). Appendix 1 also details actions that have been proposed as qualifying action under EEC 2002 – 2005.
- 3.3. If article 6(3)(b)(i)(aa) has been satisfied, article 6(3)(b)(i)(bb) of the Order can be applied. It states that if a similar qualifying action has been determined as qualifying action under EEC 2002-2005, the action will be innovative action if it results in a 'significantly greater improvement' in energy efficiency than that achieved by the EEC 2002-2005 action.
- 3.4. Ofgem has considered the following approaches to the application of article 6(3)(b)(i)(bb):
- requiring a single specified percentage improvement for all types of action above that achieved in EEC 2002-2005,
 - not stating a percentage improvement but stating the factors that Ofgem will take into consideration when making its decision, or
 - requiring a specified standard to be exceeded or a specified percentage improvement for each type of action.
- 3.5. With respect to specifying a single percentage figure for all actions, this approach would fail to take into account the different potential for improvement in the case of different actions. For instance, by installing cavity wall insulation in a property constructed after 1976 the heat loss through the walls is reduced by 60%. However, the installation of external wall insulation on a property with solid walls (those without a cavity) reduces the heat loss through the walls by

nearly 80%. This difference arises because the thermal characteristics of the walls pre insulation are much worse for the solid wall property than that for the post 1976 property and the thermal characteristics for both post insulation are similar. There is clearly more scope for an increase in the percentage improvement in energy efficiency from cavity wall insulation than there is from solid wall insulation, although the scope for an absolute energy saving after each wall has been insulated is similar. It is for this reason that Ofgem has decided not to take this approach forward.

- 3.6. In the case of stating factors rather than a threshold, Ofgem expects this would not be desirable to suppliers or manufacturers because it would fail to give an early and clear indication of products that could be eligible.
- 3.7. Ofgem considers that, where possible, stating the threshold to be exceeded for certain types of action to be innovative is consistent with the requirements of the Order and provides the greatest certainty to suppliers and manufacturers.
- 3.8. Details of thresholds or reasons why a significantly greater improvement is not likely to be achievable in the case of certain actions are provided in chapter 5. It should be noted that Ofgem considers, as a general guideline, in most cases that energy savings of 20% more than those for a similar action determined as qualifying action under EEC 2002 – 2005 represent a significantly greater increase for the purpose of the uplift. However, Ofgem's underlying principle behind setting the thresholds given in this document is that they should be challenging and demonstrate a considerably larger improvement in energy efficiency above that achieved in EEC 2002-2005. For some actions, as indicated above, there is more scope for improvement such that a larger improvement in percentage terms will be considered "significantly greater" by Ofgem. For other actions, as improvements under EEC 2002 - 2005 led to such efficient products, it is unlikely that any further improvement will be considered a significantly greater improvement for the purpose of the uplift.

4. Timetable and responses

Timetable

- 4.1. Ofgem aims to publish guidelines for innovative action under the Order by 31 July 2005. The closing date for this consultation is 30 May 2005.

Views invited

- 4.2. Comments on the matters referred to in this document should be sent to:

- 4.3. Charles Hargreaves
Head of Energy Efficiency
Ofgem
London
SW1P 3GE
Tel: 020 7901 7459
Email: charles.hargreaves@ofgem.gov.uk

Confidentiality

- 4.4. All responses will normally be published on the Ofgem website and held electronically in the Ofgem Research and Information Centre unless they are marked confidential. Respondents should confine material marked as confidential to the appendices of their responses. Ofgem would prefer to receive non-confidential responses and to receive responses in electronic form.
- 4.5. Respondents should be aware that, as Ofgem has statutory duties in respect of disclosure of information, it cannot guarantee that responses marked as confidential will not be disclosed.

Issues for consultation

- 4.6. Ofgem would welcome comments on the issues addressed in this document, particularly the thresholds stipulated for demonstrating a significantly greater improvement in energy efficiency compared to similar actions under EEC 2002 – 2005.

5. Innovative action

- 5.1. This section details the level of improvement Ofgem considers would represent a significantly greater improvement in energy efficiency compared to a similar action under EEC 2002 – 2005 for each action type for the purpose of paragraph 6(3)(b)(i)(bb).

Eligibility

- 5.2. For a means to be classed as innovative action, it must comply with the requirements of articles 6(3)(b)(i)(aa) and 6(3)(b)(i)(bb).
- 5.3. Paragraph (3)(b)(i)(aa) provides that a qualifying action may be innovative action if it achieves an improvement in energy efficiency by a means that was not used in respect of a qualifying action under EEC 2002-2005. It follows that a new action type also falls within this paragraph.
- 5.4. The means in respect of an action is a reference to the technology employed e.g. the fibre used in cavity wall insulation to give it insulating properties. Eligibility for the uplift under this provision depends on the novelty of the means employed in relation to an action. Appendix 1 details the means used in respect of qualifying actions under EEC 2002-2005⁵.
- 5.5. In addition to the technology being novel, paragraph (3)(b)(i)(bb) requires that the improvement in energy efficiency must be significantly greater than that achieved by any similar action determined as qualifying action under EEC 2002-2005. 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 has been proposed under EEC 2002-2005.
- 5.6. Paragraph (3)(b)(i)(bb) will only be applicable where a similar action has been determined as qualifying action under EEC 2002–2005. Where a similar action has not been determined as qualifying action under EEC 2002–2005, a novel action will be classed as innovative action if it achieves an improvement in

⁵ The means employed can only be confirmed once actions have been determined under EEC1. Energy Efficiency Commitment 2005-2008: Innovative Action
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energy efficiency 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), whichever is lower.

- 5.7. Under paragraph (3)(b)(i)(bb), to assess eligibility for the uplift, the improvement resulting from a qualifying action will be measured by Ofgem according to the methodology used for the accreditation in the EEC 2002-2005, i.e. according to the energy saving or key value for that similar action type. Appendix 1 outlines the actions that may, in due course, be determined as qualifying action under EEC 2002-2005 and the key assumptions⁶ used in calculating the improvement in energy efficiency for each one.
- 5.8. Respondents should be aware that, as stated in the administration guidelines,⁷ the determination of the improvement in energy efficiency for the purpose of establishing whether a supplier has met its target, will be based on the methodology used to derive the energy savings given in the EEC Scheme Spreadsheet for the EEC 2005 - 2008. The 50% uplift is, if applicable, applied to the improvement. The EEC 2002-2005 methodology is used for the assessment of eligibility for the uplift only, not the determination of the improvement in energy efficiency in EEC 2005-2008.
- 5.9. The paragraphs below address the threshold that Ofgem proposes for an improvement in energy efficiency to be a significantly greater improvement compared to that achieved by a similar action under EEC 2002-2005.
- 5.10. Ofgem is aware that certain products may have been promoted, but not notified, under EEC 2002-2005. Such products may be notified under the Order and may be innovative if the relevant criteria are met.
- 5.11. It should be noted that it will not be possible for Ofgem to draw up a definitive list of qualifying actions under EEC 2002-2005 until May 2005 at the earliest, as suppliers are not required to submit details of all their EEC 2002-2005 activity until 30th April 2005.

⁶ e.g. the U-value – the rate at which heat is lost through a through a particular construction.

⁷ Energy Efficiency Commitment 2005-2008: Administration Procedures, December 2004 (available on Ofgem's website).

- 5.12. Also, for the purposes of the Order, innovative action is a qualifying action. Ofgem can only determine the improvement in energy efficiency, and any uplift, once it has received notification that the action in question has been completed.

Significantly Greater Improvement

- 5.13. There is a natural variation in the improvements in energy efficiency achieved in relation to 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 energy efficiency improvement calculations carried out by Ofgem. An increase in the improvement in energy efficiency cannot be considered “significantly greater” for the purpose of the uplift where that level of improvement for each action was taken into account by Ofgem for the purpose of determining the improvement in energy efficiency.
- 5.14. *You are invited to comment on the views expressed below in relation to each type of action, and as to whether they are challenging and demonstrate a considerably larger improvement in energy efficiency above that achieved in EEC 2002-2005.*

Loft insulation

- 5.15. Loft insulation promoted by suppliers may be either professionally installed or for DIY installation.
- 5.16. The improvement in energy efficiency derived under EEC 2002-2005 was based on loft insulation being installed so that the loft achieved a U-value of 0.16 W/m²K. The scale of the improvement in energy efficiency 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.
- 5.17. Even if a new technology were employed to insulate lofts, the remaining heat loss through the loft is small compared to the improvement in energy efficiency as a result of insulation. With the products currently being promoted there is very little scope for decreasing the U-value of a loft, and consequently improving the energy efficiency over the standard used in EEC 2002-2005. Accordingly,

Ofgem considers it very unlikely that it will be possible to demonstrate a significantly greater improvement in energy efficiency with respect to loft insulation.

Cavity wall insulation

- 5.18. The improvement in energy efficiency derived under EEC 2002-2005 was based on reducing the U-value of a wall of a pre-1976 home from 1.44 W/ m²K to 0.48 W/ m²K or improving the U-value of a post-1976 home from 1.0 W/ m²K to 0.42 W/ m²K.
- 5.19. 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 is quite similar, a U-value of 0.48 W/m²K for the pre-76 property and 0.42 W/m²K 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 improvement in energy efficiency.
- 5.20. The determination of an improvement in energy efficiency for cavity wall insulation under EEC 2002-2005 is based on the assumptions that an unfilled cavity is of a fixed width and that the material used has a lambda, or thermal conductivity,⁸ of 0.04 W/mK. These assumptions remain the same for the purpose of accreditation in the EEC 2005-2008. When comparing products, other things being equal, a lower lambda value will equate to greater energy savings.
- 5.21. Ofgem is aware that there are cavity wall insulation products on the market that lead to a marginal improvement in energy efficiency over the standard accredited in EEC 2002-2005. A marginal improvement is not sufficient for the purpose of the uplift.
- 5.22. Ofgem proposes that a 20% improvement in energy efficiency for cavity wall insulation would be suitable to demonstrate a significantly greater improvement in energy efficiency. A cavity wall insulated with a product that has a lambda of 0.023 W/mK would meet this proposed requirement.

⁸ 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.

- 5.23. 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.

Draught-proofing

- 5.24. The energy saving attributed to draught proofing in EEC 2002-2005 is based on reducing the air infiltration of a property by 0.15 air changes per hour, which can be approximately expressed as $0.15 \text{ m}^3/\text{h}/\text{m}^2$. The improvement in energy efficiency 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 this means.
- 5.25. Ofgem proposes that to claim the incentive for draught-proofing, any new technology should be expected consistently to reduce the air permeability result of a pressurisation test from around $11 \text{ m}^3/\text{h}/\text{m}^2$ at 50 Pascals, a typical level, to less than $7 \text{ m}^3/\text{h}/\text{m}^2$ at 50 Pascals.
- 5.26. Ofgem is aware of a product under development that may reduce air infiltration other than by draught-proofing windows and doors.
- 5.27. The performance of any product will need to be independently verified and the results will need to be submitted to Ofgem. To ensure that improvements in energy efficiency for draught-proofing are realised, suppliers should ensure that draught-proofing products are targeted at homes that are expected to have a high degree of air infiltration.

External wall insulation

- 5.28. Ofgem expects that, under EEC 2002-2005, a variety of different products will be used to improve the thermal characteristics of properties with solid walls from a U-value of $2.1 \text{ W}/\text{m}^2\text{K}$ to $0.45 \text{ W}/\text{m}^2\text{K}$.
- 5.29. Ofgem proposes that suppliers should be able to claim the incentive for innovative action when a new technology in external wall insulation results in the U-value of the external wall falling from $2.1 \text{ W}/\text{m}^2\text{K}$ to $0.3 \text{ W}/\text{m}^2\text{K}$ or better, a similar value to that proposed for a cavity wall filled with material with a lambda value of $0.023 \text{ W}/\text{mK}$.

Internal wall insulation

- 5.30. As for external wall insulation, Ofgem expects under EEC 2002-2005 a variety of insulation products to be applied to the inside of solid walled properties to improve the thermal characteristics of the walls.
- 5.31. Internal wall insulation products have led to a variety of improvements in energy efficiency because of the varying nature of the products that have been proposed, including insulation slabs and padded wall paper. The best performing products would be expected to lead to a similar improvement in energy efficiency as external wall insulation.
- 5.32. However, given that the pre-insulated thermal characteristics of the walls prior to installation of the insulation is the same as for external wall insulation, Ofgem considers it appropriate to set the same target U-value for the purpose of the incentive uplift, that is a U-value of 0.3 W/m²K.

Hot water tank insulation

- 5.33. The energy saving attributed to tank jackets is based on a comparison of the market average thickness of insulation and the thickness of the jackets being installed.
- 5.34. 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 installation of tank jackets resulting in a significantly greater improvement in energy efficiency.

Radiator panels

- 5.35. Radiator panels installed for EEC 2002-2005 purposes have all been of a saw tooth design with a reflective surface. Suppliers are aware that the energy savings resulting from installation of these radiator panels were increased during the EEC 2002-2005 period due to a change to the methodology for calculating the attribution. For the avoidance of doubt, any increase in energy savings resulting from a change to the methodology for calculating an energy saving is irrelevant to the question of whether an action is innovative.

- 5.36. In the absence of any further information on the radiator panel products that are being developed, Ofgem proposes that to claim the incentive a 20% increase in energy savings attributed to radiator panels should be achieved.

Under floor insulation

- 5.37. The energy savings for under floor insulation are based on the installation of 100mm of insulation with a lambda of 0.044 W/mK. Ofgem proposes that to claim the incentive a 20% increase in the improvement in energy efficiency attributed to under floor insulation would be required to demonstrate a significantly greater improvement in energy efficiency. This could be achieved by installing 100mm of insulation with a lambda of 0.022 W/mK.

High efficiency hot water cylinders

- 5.38. The energy savings from high efficiency hot water cylinders are based on the reduction of primary pipe work losses and boiler losses. As losses are small, the energy savings attributed under EEC 2002-2005 were low for these products. The energy savings possible from high efficiency hot water cylinders are limited.
- 5.39. As primary pipe work losses and boiler losses from these products are already very small, Ofgem considers it unlikely that it will be possible to be awarded the uplift in respect of high efficiency hot water cylinders.

Lighting

- 5.40. Ofgem expects energy savings from the promotion of lighting products in EEC 2002-2005 to be awarded for the use of lamps and luminaires based on a compact fluorescent (CFL) technology only.
- 5.41. The energy savings from the use of low energy lighting are dependent on the difference between the usage and wattage of the CFL promoted and the wattage and usage of the GLS equivalent being replaced. Monitoring research carried out under the EESoP 3 programme suggests that the average CFL installed saves 78% of the electricity demand for that fitting. Energy savings to be attributed under both EEC 2002-2005 and EEC 2005-2008 reflect this.

- 5.42. There are a number of alternative lighting products being brought to the market. They will only be considered innovative under the Order if they lead to a significantly greater improvement in energy efficiency compared to CFLs.
- 5.43. Ofgem considers that the improvement compared to lighting actions under EEC 2002 – 2005 should be 20% more, ie on a like for like basis the new lamp would lead to a 94% reduction in the electricity demand for that light fitting.
- 5.44. It is worth noting that Ofgem has capped the lifetime of lighting action for the purpose of attribution of energy savings for CFLs⁹. Further, it should be noted that an increased lifetime over that taken into account in the energy saving calculation methodology for EEC 2002 – 2005 will not result in a significant improvement in energy efficiency for uplift purposes.

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

- 5.45. Under EEC 2002-2005, products providing both heat and hot water predominated over single systems providing heating or hot water requirements. Condensing gas boilers have been the most popular heating installation promoted by suppliers. The improvements in energy efficiency 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% efficient boiler and a property with a 90% efficient boiler.
- 5.46. The boilers¹⁰ installed for the purposes of 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 database equations.¹¹ Consequently, the improvements under EEC 2002 – 2005 are almost the highest possible for boilers.

⁹ This is necessary to eliminate the potential for the longest lifetime CFLs being promoted over other CFLs without due consideration for consumers' aesthetic preferences

¹⁰ For the avoidance of doubt this does not include MCHP.

¹¹ The basis on which the efficiency of all boilers is calculated.

- 5.47. Accordingly, Ofgem considers that it will not be possible for a boiler upgrade in gas, LPG or oil heated homes to achieve a significantly greater improvement in energy efficiency.
- 5.48. Other heating and hot water products have been 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.
- 5.49. The energy saving 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 energy saving 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 claim the innovative action incentive for fuel switching as there is no improvement beyond that required by law anyway.
- 5.50. With respect to other heating and hot water actions that were either notified under EEC 2002-2005 or are coming to market, performance varies considerably. Solar water heating, for instance, reduces energy demand for the provision of hot water only, while some ground source heat pumps provide all a home's heating and hot water demands. The energy saving depends on the method of heating and hot water provision before the installation of the alternative product. The improvement in energy efficiency achieved is highly dependent on the heating fuel of the property prior to installation. The table below illustrates the improvement in energy efficiency achieved by different types of solar thermal collectors and heat pumps compared to the Building Regulations minimum standard for properties heated by gas, LPG or oil. It also shows the improvement achieved compared to the average system efficiency of coal heated properties and the improvement for homes that have electric storage heaters.

Figure 5.1 Improvement in energy efficiency from the installation of heat pumps and solar thermal collectors

		Solar thermal	Solar thermal
	Heat pump	Flat plate	Evacuated tube
Gas	28.7%	8.7%	11.2%
LPG	40.5%	8.7%	11.2%
Oil	40.9%	8.6%	11.0%
Coal	72.4%	6.6%	8.4%
Electricity	67.2%	6.1%	7.9%

Notes: (1) The heat pump is assumed to have a SCOP of 2.5 and provide all the heating and hot water demand of the property.

(2) It is assumed that 4m² of solar thermal collectors are installed.

(3) For gas, LPG or oil heated properties, the comparison is to the Building Regulations standard installation. For properties that are heated by coal the comparison is to the average efficiency of coal-fired heating systems. For properties that are heated by electricity the comparison is to a home heated by electric storage heaters.

5.51. The improvement in energy efficiency achieved by the most efficient upgrades above the Building Regulations minimum standard for gas, LPG and oil under EEC 2002-2005 is in the region of 13%¹². In the absence of any further information Ofgem proposes that an increase in the improvement of energy efficiency of 20% of the standard achieved under EEC 2002-2005 would be enough to demonstrate a significantly greater improvement in energy efficiency; that is an improvement in energy efficiency of 15.6% above the Building Regulations standard. Based on the figures in the table above, the installation of a heat pump that provides all the hot water and heating demand for domestic premises would be eligible while none of the solar thermal systems would.

5.52. For homes that have been heated by coal or electric systems it is not clear whether an alternative heating system will be proposed under EEC 2002-2005. If not, both the solar thermal and heat pump technologies would be eligible for

¹² This percentage will be confirmed when all the supplier completions have been submitted and assessed.

the uplift in properties heated by these types of fuels if they are determined to be qualifying action under the Order.

- 5.53. Should a heat pump be determined as qualifying action under EEC 2002-2005 Ofgem is required, under the Order, to consider whether a particular heat pump results in a significantly greater improvement in energy efficiency compared to the action determined under EEC 2002-2005. At the time of writing it is unclear whether a heat pump will be qualifying action under EEC 2002-2005.

Heating controls

- 5.54. A variety of different heating control products have been promoted by suppliers under 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 an improvement in energy efficiency if the requirements of the Building Regulations are exceeded.
- 5.55. Evaluating the energy savings from the different heating controls is difficult because of the small change in the heat balance of a domestic property. An improvement in energy efficiency that arises from heating controls needs to be evaluated using a thermal simulation model.
- 5.56. Ofgem considers that a 20% improvement in energy efficiency from heating controls would demonstrate a significantly greater improvement in energy efficiency. This improvement should, in the case of heating controls installed with a new boiler, be a 20% increase over the improvement in energy efficiency of a heating system installed to the Building Regulations minimum compared to a fully controlled system. In the case of heating controls being installed without a boiler, this improvement should be a 20% increase over the improvement in energy efficiency of the uncontrolled heating system compared to a fully controlled system.
- 5.57. Given below are the type of heating controls that have been proposed to date in EEC 2002-2005.

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

Cold appliances

- 5.58. The amount of energy savings attributable to a cold appliance, ie 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 improvement in energy efficiency that will result from the action.
- 5.59. In the case of incentive schemes, consumers are encouraged to purchase a more efficient appliance than they might have purchased otherwise. The savings for incentive schemes are based on the sales weighted average energy consumption of similar appliances and the consumption of the product being promoted.
- 5.60. 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 energy saving 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.
- 5.61. 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 energy savings are again two-fold. Firstly, by removing an inefficient appliance, higher energy consumption is avoided. Secondly, a more efficient appliance is purchased than would normally have been the case.
- 5.62. A novel “means” in respect of the appliance, i.e. a new technology must be shown for there to be a possibility of the action being innovative. The delivery route element of the energy saving will not be relevant to eligibility for the uplift.

- 5.63. Ofgem will calculate disaggregated energy savings for cold appliance schemes so that the energy savings attributable to the appliance and to the delivery mechanism distinctly are available should this become necessary in due course (nb the greatest proportion of the improvement is attributable to the delivery mechanism).
- 5.64. The majority of the energy savings claimed for appliances under EEC 2002-2005 have been for the promotion of A-rated appliances and these have broadly led to a 28% improvement in energy efficiency. However, on 1 July 2004 A+ and A++ ratings were introduced and since then suppliers have been promoting A+ rated appliances, which is a 45% improvement in energy efficiency. To demonstrate a significantly greater improvement in energy efficiency, Ofgem proposes that suppliers should be required to promote A++ appliances. This would represent roughly a 35% improvement in energy efficiency above the improvement in energy efficiency achieved by an A+ rated appliance. While this is slightly more than for most other measures, Ofgem considers it appropriate to encourage the most efficient models to be brought to the market.

Wet appliances

- 5.65. The energy savings attributed to wet appliances, ie washing machines and dishwashers, are dependent on the type of appliance and the way it is delivered to consumers. For wet appliances there are two delivery routes: trade-in schemes and incentive schemes.
- 5.66. As for cold appliance schemes, the increased energy savings for trade-in schemes result from a two-fold improvement in energy efficiency – firstly, from removing an old, less efficient appliance from use and secondly from the promotion of a more efficient appliance. As for cold appliances, the delivery route element of the energy saving will not be eligible for the uplift.
- 5.67. Proposing a standard for wet appliances is not as clear cut as for cold appliances as the appliances already being promoted are in the highest efficiency rating. However, it has been suggested that a new A+ rating might be introduced for wet appliances and this would represent a 40% improvement over the A-rated standard achieved in 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 proposes that

this threshold should be used to demonstrate a significantly greater improvement in energy efficiency for wet appliances. While this is higher than the standards for some of the other measures it reflects the improvements in energy efficiency that have been seen in wet appliances since EEC 2002-2005 was set up.

Jug kettles

- 5.68. Only energy savings resulting from qualifying action can be subject to the uplift. As the promotion of jug kettles by suppliers would not result in an improvement in energy efficiency, jug kettles being the market norm, this could not be considered qualifying action under EEC 2005-2008.

Community based combined heat and power

- 5.69. 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.
- 5.70. In the Energy White Paper¹³ the Government stated that it would consider an incentive for CHP under the EEC. In its consultation, Defra said it had considered an incentive and the Order contains one for CHP actions of less than 50kWe.
- 5.71. It should be noted that this does not preclude larger schemes from benefiting from the incentive under the provisions of the Order. However, as there has been only a limited amount of interest in large scale CHP schemes under EEC 2002-2005 and it is not clear at this stage whether such schemes would be qualifying action, Ofgem cannot say whether the significantly greater than test is applicable.
- 5.72. Should a CHP unit with an installed capacity of more than 50 kWe be determined as qualifying action under EEC 2002-2005 Ofgem is required, under the Order, to consider whether a particular CHP unit results in a significantly greater improvement in energy efficiency compared to the action determined under EEC 2002-2005.

¹³ Energy White Paper, 'Our energy future – creating a low carbon economy', Cm 5761, February 2003.
Energy Efficiency Commitment 2005-2008: Innovative Action
Office of Gas and Electricity Markets

Community based heating schemes

- 5.73. Under EEC 2002-2005 boilers that have been used in community heating schemes, ie 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 improvement in energy efficiency from this type of action.

Appendix 1 Means used in respect of an action under EEC 2002-2005¹⁴

Action determined under Article 8(1) of the Electricity and Gas (Energy Efficiency Obligations) Order 2001	Means used	Uninsulated, business as usual or legal minimum standard	Standard installed to under 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	U-value of 0.16 W/m ² K	Reduction in U-value to 0.16 W/m ² K
Cavity wall insulation	Rockwool, mineral wool, cellulose fibre, polystyrene beads, UF foam	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/m ² K in pre 1976 homes and 0.42 W/m ² K in post 1976 homes

¹⁴ Due to the specific provisions of the EEC 2002-2005 Order, Ofgem is unable to determine whether an activity is a qualifying action before 30 April 2005. Determination of an activity as a qualifying action is dependant upon the scheme being carried out as proposed and at least 50% of the energy savings attributable to the supplier's total activities being achieved in relation to domestic consumers in the Priority Group. The list sets out the means that have been proposed as qualifying action which have not yet been determined as such by Ofgem, most of these have been submitted to Ofgem in scheme completion notifications.

Action determined under Article 8(1) of the Electricity and Gas (Energy Efficiency Obligations) Order 2001	Means used	Uninsulated, business as usual or legal minimum standard	Standard installed to under EEC 2002-2005	EEC 2002-2005 energy saving derived from
Draught proofing	Draught stripping	NA	NA	A reduction in air infiltration of 0.15 m ³ /h/m ²
External solid wall insulation	Gyprox thermal board, extruded polystyrene, expanded polystyrene, Mineral Fibre (Rockwool) Insulation Boards, phenolic foam, mineral wool slab, phenolic boards, urethane foam, British Gypsum thermal board, Weber Eglinton expolath external render, Alsecco EWS	U-value of 2.1	U-value of 0.45 W/m ² K	Reduction in U-value to 0.45 W/m ² K

Action determined under Article 8(1) of the Electricity and Gas (Energy Efficiency Obligations) Order 2001	Means used	Uninsulated, business as usual or legal minimum standard	Standard installed to under EEC 2002-2005	EEC 2002-2005 energy saving derived from
Internal solid wall insulation	Extruded polystyrene, phenolic foam, mineral wool quilt, mineral wool quilt	U-value of 2.1 W/m ² K	U-value of 0.45 W/m ² K	Reduction in U-value to 0.45 W/m ² K
Tank jackets	Installation of hot water tank insulation to 80mm	The market average insulation on a hot water tank	80 mm of insulation	Improving the insulation on hot water tanks to 80mm
Radiator panels	Saw tooth design with reflective surface	A radiator with no panel present	Installation of a saw tooth radiator panel to the area behind the radiator	The area of radiator panels installed behind radiators in a domestic property
Under floor insulation	Rockwool, mineral wool installed to 100mm depth	U-value of 0.7 W/m ² K	100mm of insulation with a lambda of 0.044 W/mK	Installing 100mm of insulation with a lambda of 0.044 w/mK
High efficiency hot water cylinders	Insulation to primary pipework	Primary pipework with	Insulation to the primary	The difference in energy

Action determined under Article 8(1) of the Electricity and Gas (Energy Efficiency Obligations) Order 2001	Means used	Uninsulated, business as usual or legal minimum standard	Standard installed to under EEC 2002-2005	EEC 2002-2005 energy saving derived from
		no insulation	pipework	consumption of a heating system with primary pipework insulated and one that is not
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 premise	Condensing gas boilers, solar thermal and ground source heat pumps	Building Regulations minimum standard	High efficiency boilers, roughly 90% efficient	Difference in energy consumption between the condensing boiler and the legal minimum standard

Action determined under Article 8(1) of the Electricity and Gas (Energy Efficiency Obligations) Order 2001	Means used	Uninsulated, business as usual or legal minimum standard	Standard installed to under EEC 2002-2005	EEC 2002-2005 energy saving derived from
Heating controls	Room thermostat, delayed start thermostat, TRVs, boiler interlock and weather or load compensation	When installed with a boiler the legal minimum standard. 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
Cold appliances	A and A+ rated appliances	Sales weighted average consumption	A and to a lesser extent A+ rated	Difference between the sales weighted average consumption and the A-rated model
Wet appliances	A rated appliances	Sales weighted average consumption	A rated	Difference between the sales weighted average consumption and the A-rated model