

## Technical Bulletin 39

### DEA Guide to Energy Companies Obligation

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## Introduction

This technical bulletin will explain current legislation and procedures relating to ECO and its impact on the work of Domestic Energy Assessors (DEAs) and Green Deal Advisors (GDAs).

## What is ECO?

ECO is the **Energy Company Obligation**. It is a new mandatory requirement under the Energy Act 2011 for all large gas and electricity suppliers to fund energy efficiency improvements to dwellings in the UK.

ECO replaces two previous schemes - CERT (Carbon Emissions Reduction Target) and CESP (Community Energy Savings Programme).



Energy suppliers who built up excess contributions under CERT and CESP can carry credits over into ECO, subject to certain qualifying circumstances.

## Which suppliers are involved in ECO funding?

For the purposes of ECO, 'large' means an electricity supplier with over 250,000 domestic customers that supplies more than 400 gigawatt hours per annum and/or a gas supplier with over 250,000 domestic customers that supplies more than 2,000 gigawatt hours per annum.

## How much do the energy suppliers have to contribute?

The obligation for each supplier will be set by Ofgem (the Office of the Gas and Electricity Markets). The suppliers are obliged to notify Ofgem how much energy they supply and they are then given a target relative to their market share.

The targets are not 'funding' targets as such - they are carbon emission and cost saving targets but, inevitably, the energy suppliers will incur expenditure (which will be passed on to all customers via their gas and electricity bills).

There are three overall targets that suppliers will jointly have to meet in the initial phases of ECO:-

- **Carbon Emission Reduction Obligation** - 20.9 million lifetime tonnes CO<sub>2</sub>
- **Carbon Savings Community Obligation**- 6.8 million lifetime tonnes CO<sub>2</sub>
- **Home Heating Cost Reduction Obligation** - £4.2bn of cost savings

### How do the energy suppliers pay for improvement measures?

This is complicated. The energy suppliers effectively buy the carbon and cost savings from installers of the improvement measures (e.g. Green Deal Providers).

There is a free market for buying ECO 'credits' of CO<sub>2</sub> and energy cost savings, so energy suppliers may pay different amounts.

Many suppliers have already pre-purchased CO<sub>2</sub> or cost savings 'credits' from installers and it is expected that there will be brokerage arrangements by which 'credits' will be traded between suppliers.

Some energy suppliers may have pre-purchased more savings credits than they need to meet their Ofgem targets, whereas others may be short of credits and so might be willing to either pay more to installers or even 'buy' credits from other suppliers.



### How does the energy user receive the ECO money?

They don't actually receive the money directly, but installers will offer free or reduced cost improvement measures to the energy user (i.e. the householder). Once the measures are in place, the installer will then claim the money for the installation of the improvement measures from the energy suppliers.

If householders are applying for the Green Deal and are eligible for ECO, they will receive a lower quote from their Green Deal Provider and will benefit from lower repayments

### When does ECO start?

ECO started on 1<sup>st</sup> January 2013 and the first three 'phases' will run until 31<sup>st</sup> March 2015. After that date, further targets are likely to be set by Ofgem on behalf of the Government.

The full rules and procedures for the running of ECO were the subject of a consultation that closed on 25<sup>th</sup> January 2013 and are not expected to be published until the end of March 2013. In the meantime, suppliers must operate under procedures contained in five 'open letters' issued by Ofgem in November 2012, copies of which can be accessed by following the link below:

<http://www.ofgem.gov.uk/Sustainability/Environment/ECO/guidance/Pages/index.aspx>

### Why are there three obligations?

Each obligation is aimed at a different section of domestic households:-

#### Carbon Emission Reduction Obligation (CERO)

This is aimed at funding insulation of properties that are considered 'hard to treat'. It covers two primary energy improvement measures:

1. The insulation of solid walls (external insulation or internal insulation)
2. The insulation of 'hard to treat' cavity walls.



If one of these qualifying "primary" measures is involved, certain "secondary" measures can also be funded, such as loft insulation and draught-proofing. District heating schemes are also a "primary" measure (see a full list of qualifying measures in the appendices of this document).

Please note that eligibility for CERO funding is not related to household income, it is purely based on the physical characteristics of the walls of a dwelling.

#### Carbon Savings Community Obligation (CSCO)

This is aimed at the insulation of properties in low income areas, with 15% of the target being reserved for low income households in rural locations. Low income areas are listed in the ECO Order and rural is defined as being "a settlement of less than 10,000 inhabitants".

CSCO involves the same insulation measures as CERO, but there is no concept of primary and secondary measures. It also covers district heating schemes (see the attached appendices for a full list of measures).

#### Home Heating Cost Reduction Obligation (HHCRO)

This is aimed at low income energy users in all geographical locations. This obligation was previously called the 'Affordable Warmth Obligation', but now the term 'Affordable Warmth Group' has been allocated to the group of households that HHCRO is seeking to help.

The 'Affordable Warmth Group' is defined by various criteria based on household income and qualifying income benefits (e.g. child tax credit, job seekers allowance, state pension credit, income support etc). The full list of qualifying benefits is included in the ECO Order.



Under this obligation, energy suppliers are targeted to achieve energy cost savings for the eligible households, not carbon savings.

The improvement measures are wide ranging including insulation, heating system upgrades, double glazing and renewable technologies (see the appendices for a full list of measures).

### Who is an eligible energy user?

All three obligations are purely for users of domestic premises, defined as being “separate and self contained premises used wholly or mainly for domestic purposes” and can include a building, part of a building or a mobile home.

Eligible energy users can be home owners, long leaseholders, tenants or those occupying under a licence of occupy. A full definition of eligible households is given in the draft ECO order, accessed by the link below:



[http://www.legislation.gov.uk/ukdsi/2012/9780111530276/pdfs/ukdsi\\_9780111530276en.pdf](http://www.legislation.gov.uk/ukdsi/2012/9780111530276/pdfs/ukdsi_9780111530276en.pdf)

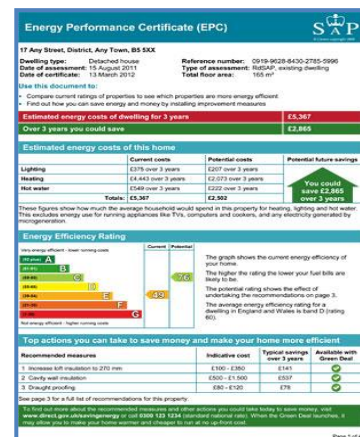
### Who decides what improvement measures can be claimed for ECO?

For **CERO** and **CESO**, recommended measures must be either:

1. Specified in a Green Deal Advice Report (GDAR)
2. Specified in a report from a Chartered Surveyor

For **HHCRO**, there is no such requirement, therefore installers and householders are free to choose which measures they wish to install.

*\*Note that, even though a GDAR is one of the ways in which improvement measures can be specified for **CERO** and **CESO**, the householder is not obliged to proceed with a Green Deal Plan.*







### What defines 'hard to treat' properties for CERO?

Solid walls of any material are eligible although, in order to claim carbon savings, the installer must insulate at least 50% of the dwelling's external wall surface area and achieve a U-value of 0.30 or less for the treated walls.



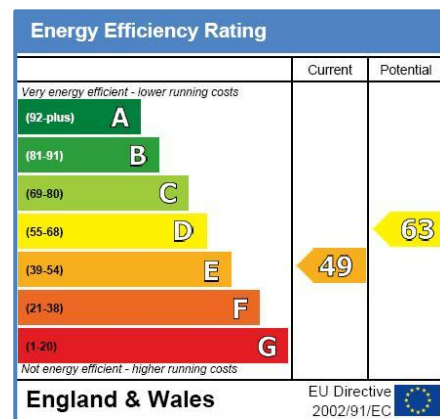
'Hard to treat' cavity walls must also be insulated to at least 50% of their external wall surface area. Walls of this type are defined as follows:

1. Cavity walls in a building over three storeys in height (not including basements)
2. Cavity walls that a Chartered Surveyor considers to be not suitable to insulate with standard materials or techniques due to exposure risks, unsuitable construction or because they are already partially filled
3. Cavity walls which a Chartered Surveyor considers to be not suitable for insulation without substantial remedial/maintenance work
4. Cavity walls with cavities of less than 50mm width
5. Cavity walls of pre-fabricated concrete construction or metal framing
6. Cavity walls verified by a Chartered Surveyor as having uneven cavities formed of natural stone inner or outer leaves

### How are CO<sub>2</sub> and cost savings calculated?

As previously explained, for CERO and CSCO the energy supplier must establish carbon dioxide emission savings over the lifetime of the improvement measure, and for HHCRO the energy supplier must establish cost savings over the lifetime of the measure.

SAP and RdSAP are the prescribed methodologies for these calculations. If SAP and RdSAP are deemed to be inappropriate, other methodologies may be used subject to prior approval from Ofgem.



A SAP or RdSAP calculation must be undertaken both before and after the implementation of each measure to establish the annual CO<sub>2</sub> emission savings or energy cost savings resulting from implementation of the measure.

The Ofgem guidance suggests that both CO<sub>2</sub> and cost savings should be calculated for all of the obligations even though, strictly speaking, **CERO** and **CSCO** need only CO<sub>2</sub> savings and **HHCRO** needs only cost savings.

The calculation the energy suppliers must provide is as follows:

$$S \times L \times (100\% - I) = \text{Lifetime Saving}$$

Where:

**S** = annual tonnes of carbon dioxide savings (to three decimal places) or energy cost saving (rounded to the nearest £)

**L** = lifetime of the measure taken from a table on the Ofgem website (see appendices to the rear of this document)

**I** = 'In-use factor' for the measure *applied to CERO and CSCO only*, also from a table on the Ofgem website (see appendices to the rear of this document)

### Must an EPC be lodged to verify the calculations?

No - the Ofgem guidance suggests that EPCs may be lodged after calculating savings but this is not mandatory. However, DEAs undertaking the SAP or

RdSAP calculation must retain records of their calculations, including evidence of their data entry. This can be done by saving/printing a copy of the 'Summary Information' which is available as a download on the Results page of the Elmhurst RdSAP software.

Please note that calculations will be subject to random Quality Assurance audits by Ofgem to verify that they are being undertaken appropriately and within the accepted tolerances of EPC accuracy.

### Can Elmhurst users use Energy Performance Reports (EPRs) for these calculations?

Yes - Elmhurst users are able to produce Energy Performance Reports (EPRs) via the RdSAP software. An EPR is effectively an 'un-lodged' EPC and can be used to display CO<sub>2</sub> and cost savings from improvement measures.

NB – please be aware that some energy suppliers may insist on EPCs for ECO purposes, in which case EPRs would not be acceptable for their purposes.





### Do I have to calculate savings from each measure separately?

Yes - energy suppliers have to claim the CO<sub>2</sub> or cost savings from the implementation of each improvement measure separately, so separate SAP or RdSAP calculations will be necessary for each measure.

When more than one improvement measure is being undertaken, the savings calculated for each measure must reflect the effect of the other measures being undertaken at the same time. This means that assessors will need to perform several sequential calculations, having regard to the order of improvement measures in RdSAP calculations.



The list of recommended measures in RdSAP is as follows. The software calculates the effect of implementing a measure after first calculating the effect of implementing all others further up the list:

1. Loft insulation
2. Flat roof insulation
3. Room-in-roof insulation
4. Cavity wall insulation
5. Internal or external solid wall insulation
6. External wall insulation with cavity insulation (alternative)
7. Floor insulation
8. Cylinder jacket
9. Draught proofing
10. Low energy lighting
11. Cylinder thermostat
12. Heating controls (wet system)
13. Heating controls (warm air system)
14. Biomass boiler
15. Wood pellet stove and radiators
16. Biomass boiler (alternative)
17. Air or ground source heat pump (alternative)
18. Air or ground source heat pump and under-floor heating (alternative)
19. Micro-CHP (alternative)
20. Replacement condensing gas or oil boiler, same fuel
21. Condensing oil boiler (from warm air)
22. Condensing gas boiler (from gas fires)
23. Condensing gas boiler, fuel switch
24. Flue gas heat recovery in conjunction with new boiler



- 25. Replacement storage heaters
- 26. Replacement warm air unit
- 27. Solar water heating
- 28. Waste water heat recovery
- 29. Energy efficient glazing
- 30. Secondary glazing
- 31. Insulated doors
- 32. Photovoltaics
- 33. Wind turbine

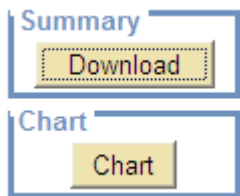
So, for example, if a supplier requires saving calculations for loft insulation, a cylinder jacket and replacement condensing boiler (same fuel), the DEA would need to undertake three 'before' and 'after' calculations, one for each of these three measures.

First, calculate the CO<sub>2</sub> and cost savings for the loft insulation alone by undertaking 'before' and 'after' calculations (producing EPRs or EPCs, depending on the supplier's requirements).

Next, undertake 'before' and 'after' calculations for the cylinder jacket using the calculation with the loft insulation improvement as the new 'before' calculation.

Finally, undertake 'before' and 'after' calculations for the replacement boiler, using the calculation with loft insulation and cylinder jacket as the new 'before' calculation.

**Where do I take the CO<sub>2</sub> and energy cost savings data from?**



The annual CO<sub>2</sub> and energy cost data needed for ECO calculations is provided in the "Summary Information" report accessed by clicking "Summary - Download" on the "Results" page in Elmhurst RdSAP.

<b>Survey Reference:</b>	000002		
<b>Current SAP rating:</b>	D 59	<b>Potential SAP rating:</b>	B 87
<b>Current EI rating:</b>	D 56	<b>Potential EI rating:</b>	B 88
		<b>CO2 Emissions (t/year):</b>	3.725 tonnes
		<b>Fuel Bill:</b>	£806

This report totals the annual energy cost for heating, hot water and lighting and provides the annual carbon emissions in tonnes of CO<sub>2</sub> to three decimal places, as required for ECO calculations.





To calculate the annual CO<sub>2</sub> or cost savings from the implementation of a measure, it is necessary to undertake before and after RdSAP calculations for each improvement measure being installed under ECO, taking the “after” values from the “before” values.

When more than one measure is being installed in the same month, these calculations have to be undertaken sequentially, as per the ordered list of improvement measures set out above.

The annual CO<sub>2</sub> or cost savings for each measure are used in the lifetime savings ECO calculation ( $S \times L \times (100\% - I) = \text{Lifetime Saving}$ ), as explained earlier.

**NOTE: Do not use the savings figures headed “ECO Results” in the Summary Information report because these are based on generic RdSAP recommendation standards, not the actual standards of improvement achieved by the ECO installers.**

### Worked Example

So let’s use the example given earlier about a dwelling having improvements to loft insulation, hot water cylinder insulation and a replacement boiler.

#### Step One

The first task is to enter RdSAP for the dwelling in its existing condition. Using the values from the image above, annual CO<sub>2</sub> emissions are 3.725 tonnes and annual energy costs are £806. This is the base case “before” result.

#### Step Two

Next do another RdSAP calculation to reflect the improved loft insulation only. Let’s say that this results in annual CO<sub>2</sub> emissions of 3.610 tonnes and total annual costs of £750. This is the first “after” result. Take the “after” values from the “before” values:-  $3.725 - 3.610 = 0.115$  tonnes of CO<sub>2</sub> and  $£806 - £750 = £56$  of annual cost savings. These values can be used in the Lifetime Saving calculation for ECO for the loft insulation.

#### Step Three

Now do another RdSAP calculation to reflect the loft insulation and the cylinder insulation improvement. Let’s say this gives CO<sub>2</sub> of 3.422 and total energy cost of £720.



This is the second “after” result. Take these values from the first “after” results, not the original “before” results. So the maths is  $3.610 - 3.522 = 0.088$  annual tonnes of CO<sub>2</sub> saving and  $£750 - £720 = £30$  annual cost saving. These are the savings for the cylinder insulation alone, on the assumption that the loft insulation improvement has already been implemented.

#### Step Four

Finally, do yet another RdSAP calculation, this time reflecting the loft insulation improvement and the cylinder insulation improvement and the replacement boiler. Let’s say that this results in annual CO<sub>2</sub> emissions of 2.456 tonnes and total annual energy costs of £520. This is the final “after” result.

Take the final results from the previous “after” results. The maths is  $3.522 - 2.456 = 1.066$  annual tonnes of CO<sub>2</sub> saved and  $£720 - £520 = £200$  of annual cost saving for the replacement boiler, on the assumption that the loft insulation and cylinder insulation have already been completed.

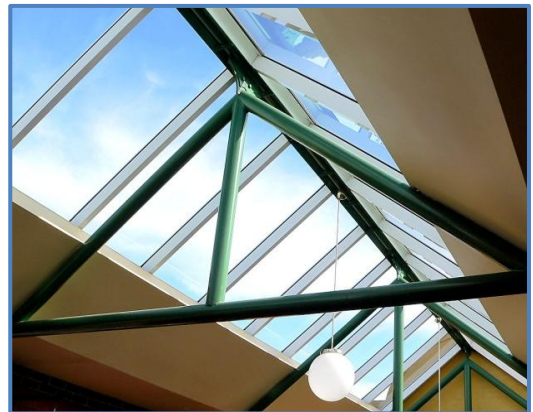
#### What happens if insulation is only being applied to part of a property?

Ofgem accepts that, sometimes, it is not physically possible or appropriate to insulate 100% of walls, roofs or floors. In this case, the savings from partial insulation can be calculated using the ‘extension’ and ‘alternative wall’ functionality in the RdSAP software to record the differing standard of insulation present for the various sections of the walls, roofs or floors.

#### Is there a special rule for glazing calculations?

Yes - under ECO, energy suppliers can only claim CO<sub>2</sub> or cost savings resulting from improving window or roof-light U-values below a U-value of 1.6 (this being the maximum U-value allowed for new glazing in existing buildings under the England, Wales and Scotland Building Regulations).

So, for calculating savings from glazing, the ‘before’ calculation must be done by entering a U-value of 1.6 for the glazing to be replaced. For the ‘after’ calculation, the actual U-value of the replacement windows should be entered.



**Note1:** Any windows or roof-lights that are not being replaced should be entered using the normal RdSAP default U-values or their actual U-values (if documentary evidence is available).



**Note2:** When undertaking saving calculations for glazing, DEAs should use the 'Much more than typical' data entry option unless all windows and roof-lights are being replaced to the same U-value standard. Even then, better savings might be achievable when using 'Much more than typical' data entry.

### How are repaired or replacement boiler savings calculated for HHCRO?

The repair or replacement of a boiler is one of the measures that qualify for the **Home Heating Cost Reduction Obligation (HHCRO)**. To qualify, the energy user must first arrange for the boiler to be inspected by a competent heating engineer who must certify that the boiler is defective. Ofgem has published a checklist that the engineers must complete when undertaking these inspections.

To qualify for repair, a boiler must be declared by the engineer to be 'not functioning efficiently' or 'broken down' and it must have a 'when repaired' efficiency of at least 86%.

To qualify for replacement, a boiler must be declared by the engineer to be 'not functioning efficiently' or 'broken down' and 'cannot be economically repaired'.

In both circumstances, the energy supplier claiming under **HHCRO** will need 'before' and 'after' calculations to justify the cost savings.

The methodology for calculating cost savings for a repaired or a replacement boiler is:

$$(A - B) \times N$$

Where:

**A** = The cost of heating the dwelling assuming there is no functioning heating system\*.

\*See base-case boiler calculation conventions below.

**B** = The cost of heating the dwelling with the repaired or replacement boiler.

**N** = For repaired boilers, N=1 when a one year warranty is provided, N=2 if a two year warranty is provided. Where a boiler is being replaced N=12



### Boiler calculation conventions

Ofgem has issued conventions for undertaking repaired and replacement boiler “before” and “after” calculations.

For the “before” calculation:

- Set Main Heating 1 to NON
- Set heating controls for Main Heating 1 to NON
- If there is Main Heating 2 in the dwelling, enter it as exists in the dwelling
- Ignore any secondary heaters, i.e. enter the Secondary Heating code as blank
- Set Hot Water Heating to NON if provided by Main Heating 1 or the Secondary Heating. If from Main Heating 2 or an independent system enter as in the dwelling
- Set electricity tariff to standard rate unless Main Heating 2 or independent water heating needs a dual tariff, i.e. electric storage heating or dual rate immersion water heater

For the “after” calculation:

- Enter the PCDF boiler code or generic RDSAP code as Main Heating 1 for the repaired and replacement boiler
- Enter Main Heating 2 as existing in the dwelling
- Enter any secondary heating as existing in the dwelling
- Enter hot water heating as existing in the dwelling
- Enter electricity tariff as existing in the dwelling





### Is Elmhurst creating new ECO software?

Yes - we will shortly be releasing a new software tool to help our users undertake CO<sub>2</sub> and cost saving calculations to help with ECO. The new ECO software will allow users to calculate CO<sub>2</sub> and cost savings for all improvements in one RdSAP calculation.

Users will no longer be required to undertake separate calculations for each improvement measure. The ECO software will also automatically calculate the lifetime savings and the boiler repair/replacement calculations.

## 1. List of ECO measures

<b>Ofgem Table of ECO Measures Applicable to Each Obligation - Feb 2013</b>			
<b>MEASURE</b>	<b>CERO</b>	<b>CSCO</b>	<b>HHCRO</b>
Internal Wall Insulation of Solid Brick, built before 1967 England & Wales (1965 Scotland)	✓ Primary	✓	✓
Internal Wall Insulation of Solid Brick, built during or after 1967 England & Wales (1965 Scotland)	✓ Primary	✓	✓
External Wall Insulation, Solid Brick, built before 1967 England & Wales (1965 Scotland), plus solid wall of other material irrespective of date	✓ Primary	✓	✓
External Insulation, Solid Brick, built during or after 1967 England & Wales (1965 Scotland), plus solid wall of other material irrespective of date	✓ Primary	✓	✓
Park Home External Wall Insulation	✓ Primary	✓	✓
Cavity Wall Insulation	✓ Secondary	✓	✓
Hard to Treat Cavity Wall Insulation	✓ Primary	✓	✓
Loft Insulation (Ceiling or Rafters)	✓ Secondary	✓	✓
Room In Roof Insulation	✓ Secondary	✓	✓
Flat Roof Insulation	✓ Secondary	✓	✓
Under Floor Insulation	✓ Secondary	✓	✓
Hot Water Cylinder Insulation	✓ Secondary	✓	✓
Pipe-work Insulation	✓ Secondary	✓	✓
Draught Proofing	✓ Secondary	✓	✓
Window Glazing	✓ Secondary	✓	✓
Passageway Walk-Through Doors	✓ Secondary	✓	✓
Boiler Replacement/Installation			✓



Boiler Repair			✓
Electric Storage Heaters			✓
Warm Air Heating			✓
Heating Controls			✓
Flue Gas Heat Recovery Systems			✓
Heat Recovery Ventilation			✓
Radiator Panels			✓
District heating – New Connections and Upgrades	✓ Primary	✓	✓
District Heating – Heat Meters	✓ Secondary	✓	✓
Air Source Heat Pumps			✓
Ground Source heat Pumps			✓
Biomass Boilers			✓
Micro Combined Heat and Power			✓
Photovoltaic			✓
Micro Wind Generation			✓
Micro Hydro Generation			✓

## 2. Lifetimes of Measures

<b>Ofgem Table 3 – Lifetime for a measure completed under ECO (Feb 2013)</b>	
<b>MEASURE</b>	<b>LIFETIME</b>
Internal Wall Insulation of Solid Brick, built before 1967 England & Wales (1965 Scotland)	36
Internal Wall Insulation of Solid Brick, built during or after 1967 England & Wales (1965 Scotland)	36
External Wall Insulation, Solid Brick, built before 1967 England & Wales (1965 Scotland), plus solid wall of other material irrespective of date	36
External Insulation, Solid Brick, built during or after 1967 England & Wales (1965 Scotland), plus solid wall of other material irrespective of date	36
Park Home External Wall Insulation	30
Cavity Wall Insulation	42
Hard to Treat Cavity Wall Insulation – Cavity infill System	42
Hard to Treat Cavity Wall Insulation – Solid Wall System	36
Loft Insulation (Ceiling or Rafters)	42
Room In Roof Insulation	42
Flat Roof Insulation	20
Under Floor Insulation	42
Hot Water Cylinder Insulation	10
Pipework Insulation	15
Draught Proofing	10
Window Glazing	20
Passageway Walk-Through Doors	15
Boiler Replacement/Installation	12



Boiler Repair	1 or 2 depending on warranty
Electric Storage Heaters	20
Warm Air Heating	20
Heating Controls	12
Flue Gas Heat Recovery Systems	12
Heat Recovery Ventilatio	10
Radiator Panels	10
District heating – New Connections and Upgrades	Biomass 30 Gas/Oil 25 CHP 15
District Heating – Heat Meters	15
Air Source Heat Pumps	15
Ground Source heat Pumps	20
Biomass Boilers	20
Micro Combined Heat and Power	15
Photovoltaics	25
Micro Wind Generation	10
Micro Hydro Generation	20

### 3. Eco In-Use Factors

<b>Ofgem Table 4 – Relevant ‘In-use’ factors for measures installed under CERO and CSCO (Feb 2013)</b>	
<b>MEASURE</b>	<b>In-Use Factor</b>
Cavity Wall Insulation (including hard to treat cavities)	35%
Draught Proofing	15%
External solid wall insulation for a mobile (park) home	25%
Flat Roof Insulation	15%
High Performance External Doors and Passageway Walkthrough Doors	15%
Loft or rafter Insulation	35%
Pipework Insulation	15%
Room in Roof Insulation	25%
Secondary Or Replacement Glazing	15%
Solid Wall Insulation of Solid Brick Walls, Built before 1967 Eng & Wales (1965 Scotland)	33%
Solid Wall Insulation of Solid Brick Walls, built during or after 1967 (1965 Scotland) plus Solid wall Insulation of walls of other Materials	25%
Under Floor Insulation	15%
<b>All Other Measures</b>	<b>15%</b>