

## **UK Annual Report against Article 24(1) of the Energy Efficiency Directive 2012: April 2015**

### **Background**

This report sets out the information that Member States must provide annually to the Commission under Article 24(1) of the Energy Efficiency Directive (“the Directive”) to report progress achieved towards national energy efficiency targets, in accordance with Annex XIV Part 1. This provides an update to the detailed information reporting in the 2014 National Energy Efficiency Action Plan which reported progress against these aspects together with wider developments.

### **Summary of specific delivery**

#### **a) Overview of progress in reducing energy consumption**

A table reporting the latest UK statistical data required by point (a) of Annex XIV of the Directive is at Annex A.

Overall, energy consumption in the UK is on a downward trend. Primary energy consumption in 2013 was 9% lower than in 2007 and final energy consumption was 8% lower.

Looking at the sub-sectors and the 2013 statistics:

- Industrial energy consumption fell by 3% since 2012 and by 20% since 2007.
- On a temperature adjusted basis, household energy consumption fell by 2% since 2012 and by 13% since 2007<sup>1</sup>.
- Service sector energy consumption has increased by 3% since 2012 and by 10% overall since 2007. This is due to strong growth in this sector but with energy intensity falling by 8% since 2012.
- Overall transport energy consumption was unchanged since 2012. Increased freight activity due to the economic recovery contributed to this. Since 2007 transport consumption has fallen by 11%.

#### **b) Major legislative and non-legislative measures implemented**

There have been three key developments since the UK last submitted a formal notification to the European Commission on progress towards achieving one or more of the targets established by the Directive.

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<sup>1</sup> Temperature adjusted series from UK National Statistics, *Energy Trends* table 1.3c  
<https://www.gov.uk/government/statistics/total-energy-section-1-energy-trends>

- 1) Earlier this year we formally notified the Commission the UK had completed legal transposition of the Directive. Legislation transposing the Directive has been uploaded to the Commission's dedicated website, along with a series of transposition notes detailing the approach taken, both legislative and non-legislative, to implementation.
- 2) In February 2015, the UK Government announced the results of our consultation on the domestic and non-domestic private rented sector energy efficiency Regulations.<sup>2</sup> The Energy Efficiency (Private Rented Sector) (England and Wales) Regulations 2015 ("the Private Rented Sector Regulations") were made in March 2015.

We referred to the UK Government's intention to make these Regulations in the 2014 National Energy Efficiency Action Plan (paragraph 1.7).<sup>3</sup> The Regulations will improve the energy efficiency of privately rented properties in the domestic and non-domestic sectors in England and Wales. The Regulations will mean that:

- From April 2018, landlords will need to ensure their properties reach at least an 'E' EPC rating.
- Landlords may be eligible for an exemption from meeting this minimum standard where:
  - they have installed those improvements that meet the Green Deal's Golden Rule (domestic), or would meet a seven year simple payback (non-domestic);
  - despite reasonable efforts, they cannot obtain necessary consents to install the required energy efficiency improvements;
  - a qualified expert has provided written advice that the measures will reduce a property's value by 5% or more, or that wall insulation required to improve the property will damage the property.
- The minimum standard requirements will apply in a phased manner, applying to new and renewed leases from 1 April 2018, before applying to all domestic tenancies from 1 April 2020, and all non-domestic leases in scope from 1 April 2023.
- Local authorities will be required to enforce compliance with the provisions, and will have power to issue compliance notices seeking information from landlords about suspected breaches of the Regulations and, in the case of a breach, to issue penalty notices imposing financial penalties. Landlords will be able to request that a local authority reviews any penalty imposed for non-compliance, and will have the right to appeal a penalty to a tribunal.

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<sup>2</sup> The responses to the domestic and non-domestic consultations are available via the links below.  
<https://www.gov.uk/government/consultations/private-rented-sector-energy-efficiency-regulations-domestic>

<https://www.gov.uk/government/consultations/private-rented-sector-energy-efficiency-regulations-non-domestic>

<sup>3</sup> <https://www.gov.uk/government/publications/the-uks-national-energy-efficiency-action-plan-and-building-renovation-strategy>

Savings specifically driven by the Private Rented Sector Regulations have now been included in the Article 7 savings presented below.

- 3) The UK has continued to work with the Commission and member states to develop ecodesign and energy labelling implementing measures that reduce emissions and benefit consumers. Three ecodesign measures (solid fuel boilers, solid fuel local space heaters and professional refrigeration) have been agreed since April 2014, and several implementing measures have now commenced and the products concerned subject to market surveillance. In July we published a report showing the benefits of products policy “Efficient Products – helping us cut energy use”, which is available at <https://www.gov.uk/government/publications/energy-efficient-products-helping-us-cut-energy-use>

### **c) Share of Central Government buildings not meeting the requirements referred to in Article 5(1)**

Member States are required to report the total building floor area of the buildings with a total useful floor area over 500 m<sup>2</sup> and as of 9 July 2015 over 250 m<sup>2</sup> owned and occupied by the Member States’ central government that, on 1 January of the year in which the report is due, did not meet the energy performance requirements referred to in Article 5(1).

To calculate floor area, data has been taken from the electronic Property Information Mapping Service database (ePIMS). ePIMS provides data on the floor area of buildings within the central civil estate. To gather data on the floor area of buildings within the rest of central government’s estate, the following data has also been collected:

- Data on the floor area of buildings within the Ministry of Defence’s estate.
- Data on the floor area of building within the Scottish government’s estate.
- Data on the floor area of building within the Welsh government’s estate.
- Data on the floor area of building within the Northern Irish government’s estate.

These datasets have been combined in order to calculate the floor area of the entire central government estate. The datasets have then been filtered in order to remove buildings referred to in Article 5(2), so that only owned and occupied buildings are included and so that only buildings with a floor area greater than 500 square meters are included. This gives a figure of 12.5 million square meters.

To calculate the floor area of buildings which do not meet the energy performance requirements referred to in Article 5(1) it was then necessary to filter out any buildings which do meet the minimum energy performance requirements. The

minimum requirements referred to in Article 5(1) are elemental (e.g. they specify a boiler of a particular efficiency, walls of a particular U-Value). They are taken to correspond to the specifications in Part L2B of the 2010 Building Regulations relating to refurbishments of existing buildings other than dwellings.

There has been a limited amount of time for the latest building regulation standards to take effect. Therefore, a cautious assumption has been made that all buildings referred to in Article 5(1) do not meet the minimum energy performance requirements.

Therefore, the total building floor area of buildings with a useful floor area over 500 square meters, which did not meet the energy performance requirements referred to in Article 5(1) is calculated to be 12.5 million square meters.

#### **d) The amount of energy savings in Central Government buildings**

Member States are required to report the total building floor area of heated and/or cooled buildings owned and occupied by the Member States' central government that was renovated in the previous year referred to in Article 5(1) or the amount of energy savings in eligible buildings owned and occupied by their central government as referred to in Article 5(6).

The UK has adopted the approach referred to in Article 5(6). For the UK, relevant energy savings come from three separate policies. Those policies are the Greening Government Commitments, the Scottish Government's Carbon Management Plan and the Welsh Government's Climate Change Strategy.

In order to calculate energy savings, energy consumption data for buildings within scope of the above policies has been collected for 2013 and 2014. Energy savings in 2014 have then been calculated by subtracting energy consumption in 2013 from energy consumption in 2014. This calculation has been carried out at the most granular level possible. As a result, energy savings have been calculated for individual departments within the Greening Government Commitments.

Energy savings, from the above policies, have then been adjusted in order to calculate energy savings as referred to in Article 5(6). Energy savings have been adjusted using data on the floor area of central government buildings.

Floor area data have been collected using the ePIMS database, Ministry of Defence data, Scottish government data, Welsh government data and Northern Irish government data. These data sets have been combined in order to calculate the total floor area of each individual central government department.

For each central government department, the floor area of buildings meeting the requirements of Article 5(6) has then been calculated by removing data on:

- buildings referred to in Article 5(2),
- buildings that are not owned and occupied, and
- buildings with a floor area less than or equal to 500 square meters.

For each central government department, the floor area of buildings meeting the requirements of Article 5(6) has then been divided by the total floor area of that central government department. This calculation gives the proportion of floor area that meets the requirements of Article 5(6).

For each central government department, the proportion of floor area that meets the requirements of Article 5(6) has then been multiplied by the relevant energy savings from the Greening Government Commitments, Carbon Management Plan or Climate Change Strategy. These calculations give the energy savings meeting the requirements of Article 5(6) for each central government department.

The energy savings, meeting the requirements of Article 5(6), for all central government departments, have then been added together. This calculation gives a final result of 272 GWh of energy savings in 2014 in eligible buildings owned and occupied by central government as referred to in Article 5(6).

**e) Energy savings achieved through the national energy efficiency obligation schemes referred to in Article 7(1) or the alternative measures adopted in application of Article 7(9)**

The UK target under Article 7 remains 324 TWh of energy savings as measured on a Gross Calorific Value basis. This is calculated based on cumulative end-use energy savings equivalent to 1.5% of annual energy sales to final energy users relative to the average energy sales over the period 2010-12. A 25% reduction is applied based on the derogations available under Article 7(2) and Article 7(3). Details of this were set out in the UK's notification in June 2014. This annual assessment reports a total of 523 TWh.

The UK has one live Energy Obligation that has been operational since 2013. Statistics reporting delivery of measures through the Energy Company Obligation are published monthly and summarised in the table below.

## Summary of measures installed under the Energy Company Obligation<sup>4</sup>

	2013	2014	TOTAL
Boiler	167,297	116,887	284,184
Other Heating	30,346	53,441	83,787
Cavity wall insulation	172,162	320,945	493,107
Loft Insulation	129,540	216,018	345,558
Solid Wall Insulation	27,518	49,108	76,626
Other Insulation	1,768	8,973	10,741
Window Glazing	255	2,183	2,438
<b>All measures</b>	<b>528,886</b>	<b>767,555</b>	<b>1,296,441</b>

Source: ECO statistics

The energy savings derived from these measures are reported in Annex B alongside the savings from alternative measures. Updated descriptions of the measures are provided in Annex C.

A significant share of the UK savings are delivered through alternative measures, many of which use the methodology of deemed savings. These are material savings driven by regulation, investment, financial incentives or energy efficiency advice across homes, businesses, public sector and transport to realise energy savings that would not have been made without the policy. The measurement of the amount and type of action taken varies between the different types of scheme. In some cases savings are based on measurement of the specific actions taken (e.g. walls insulated), others are measured through the UK Government's evaluation programmes.

The savings presented in this report are based on the latest savings assessments made based on the evidence available on the impact of measures (further details explained in the annex). The UK produces annual energy & emissions projections which include the estimated impact of these policies driving review of these savings at least annually with analysis updated to reflect the latest economic growth and price assumptions.

The policy descriptions and methodology for each policy are provided as Annex C. These explain how some specific issues around overlaps and additionality are handled. The energy savings from UK policies are deemed savings and have been calculated according to the UK policy appraisal guidelines<sup>5</sup>. The guidance provides a common methodology for key issues such as determining a baseline counterfactual, together with providing a common methodology for valuing energy and carbon

<sup>4</sup> Source: DECC Green Deal and ECO statistics <https://www.gov.uk/government/collections/green-deal-and-energy-company-obligation-eco-statistics#monthly-statistics>

<sup>5</sup> This guidance supplements the HMT Green Book that provides general guidance on how to conduct appraisal and evaluation of energy use and greenhouse gas emissions. <https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal>

savings. Baseline counterfactuals allow for known policy overlaps. The Department of Energy & Climate Change collates energy savings for measures across the UK Government and Devolved Administrations and where necessary applies a policy ranking to adjust pre-policy demand for lower ranked policies in the merit order to avoid double-counting of savings.

## ANNEX A: UK statistics

This annex reports the recent trends in energy consumption and the headline statistics for 2013<sup>6</sup>.

	Data for 2013	Units
(i) primary energy consumption <sup>7</sup> ;	192.5	mtoe (ncv)
(ii) total final energy consumption;	133.9	mtoe (ncv)
(iii) final energy consumption by sector		
— industry mtoe	23.0	mtoe (ncv)
— transport (passenger) <sup>8</sup>	36.7	mtoe (ncv)
— transport (road freight transport)	13.8	mtoe (ncv)
— households	40.5	mtoe (ncv)
— services;	19.0	mtoe (ncv)
— agriculture;	0.9	mtoe (ncv)
(iv) gross value added by sector		
— industry	367.3	billion € 2011 prices
— services;	1,390.0	billion € 2011 prices
(v) disposable income of households;	1,242.6	billion € 2011 prices
(vi) gross domestic product (GDP);	1,949.6	billion € 2011 prices
(vii) electricity generation from thermal power generation;	27.6	mtoe (ncv)
(viii) electricity generation from combined heat and power;	1.8	mtoe (ncv)
(ix) heat generation from thermal power generation;	3.8	mtoe (ncv)
(x) heat generation from combined heat and power plants, including industrial waste heat;	4.0	mtoe (ncv)
(xi) fuel input for thermal power generation;	69.4	mtoe (ncv)
(xii) passenger kilometres (pkm), if available;	768.0	billion kms
(xiii) tonne kilometres (tkm), if available;	222.0 <sup>9</sup>	billion tonne-kms
(xiv) combined transport kilometres (pkm + tkm), in case (xii) and (xiii) are not available;	n/a	
(xv) population.	63.9	millions

<sup>6</sup> Energy statistics consistent with the Digest of UK Energy Statistics definitions, presented on a net calorific value basis. <https://www.gov.uk/government/statistics/digest-of-united-kingdom-energy-statistics-dukes-2014-printed-version>

<sup>7</sup> Excluding non-energy use

<sup>8</sup> Includes freight activity for rail, aviation and shipping

<sup>9</sup> Latest tonne-kilometres are for 2010

## ANNEX B: Table of estimated savings by policy

TWh (Gross Calorific Value)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	TOTAL
<b>Carbon Emissions Reduction Target (2010-2012)*</b>	2.7	5.7	9.1	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.9	8.8	8.6	<b>116.1</b>
<b>Community Energy Savings Programme (2010-2012)*</b>	0.0	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	<b>5.1</b>
<b>Energy Company Obligation*</b>				0.5	1.1	1.9	2.6	3.6	4.5	5.5	6.2	6.9	7.5	7.7	<b>48.0</b>
<b>Green Deal - domestic</b>					0.1	0.0	0.0	0.0	0.1	0.1	0.1				<b>0.4</b>
<b>Private Rented Sector Regulation (England &amp; Wales) - domestic</b>					0.0	0.0	0.0	0.1	0.1	0.2	0.3				<b>0.8</b>
<b>Private Rented Sector Regulation (England &amp; Wales) - non-domestic</b>					0.0	0.0	0.4	0.7	1.1	1.4	1.7				<b>5.3</b>
<b>Private and Social Sector Regulation (Scotland)</b>					0.0	0.1	0.1	0.2	0.3	0.4	0.4				<b>1.5</b>
<b>Home Energy Efficient Programmes (Scotland)</b>					0.2	0.5	0.7	0.9	1.0	1.0	1.0				<b>5.4</b>
<b>Sustainable Energy Programme (Northern Ireland)</b>					0.1	0.1	0.2	0.2	0.2	0.2	0.2				<b>1.3</b>
<b>Building Regulations - domestic</b>					4.7	9.4	14.0	18.7	23.4	28.0	32.6				<b>130.8</b>
<b>Building Regulations - non-domestic</b>					2.4	4.8	7.0	9.3	11.4	13.5	15.6				<b>64.0</b>
<b>Climate Change Levy</b>					7.1	6.5	6.2	6.4	6.6	6.4	6.4				<b>45.5</b>
<b>Climate Change Agreements</b>					3.9	3.6	3.4	3.6	3.7	3.7	3.6				<b>25.6</b>
<b>CRC Energy Efficiency Scheme</b>					2.2	2.9	3.7	4.5	5.3	6.1	7.0				<b>31.8</b>
<b>Smart metering (Non-domestic)</b>					0.2	0.5	1.1	1.8	2.6	3.4	3.9				<b>13.5</b>
<b>Energy Savings Opportunity Scheme</b>					0.0	0.0	3.2	3.1	3.2	3.1	3.1				<b>15.7</b>
<b>Salix public sector finance</b>					0.0	0.1	0.2	0.3	0.3	0.4	0.5				<b>1.7</b>
<b>Greening Government Commitment</b>					0.4	0.4	0.4	0.4	0.4	0.4	0.4				<b>2.7</b>
<b>Re:Fit</b>					0.0	0.0	0.1	0.1	0.1	0.1	0.1				<b>0.6</b>
<b>Rail electrification</b>					0.0	0.0	0.0	0.0	1.1	1.1	1.1				<b>3.5</b>
<b>Low Emission Vehicle policies</b>					0.1	0.1	0.3	0.4	0.6	0.8	1.2				<b>3.5</b>
<b>TOTAL</b>	<b>2.7</b>	<b>5.8</b>	<b>9.6</b>	<b>9.9</b>	<b>31.9</b>	<b>40.4</b>	<b>53.2</b>	<b>63.8</b>	<b>75.6</b>	<b>85.4</b>	<b>94.9</b>	<b>16.3</b>	<b>16.7</b>	<b>16.7</b>	<b>523.0</b>

## **ANNEX C – Descriptions of policy**

CARBON EMISSIONS REDUCTION TARGET (CERT) .....	11
COMMUNITY ENERGY SAVINGS PROGRAMME (CESP) .....	16
ENERGY COMPANY OBLIGATION (ECO) .....	21
GREEN DEAL .....	27
PRIVATE RENTED SECTOR (PRS) REGULATIONS: ENGLAND AND WALES....	30
PRIVATE & SOCIAL REGULATION: SCOTLAND.....	35
HOME ENERGY EFFICIENCY PROGRAMMES: SCOTLAND .....	37
NORTHERN IRELAND SUSTAINABLE ENERGY PROGRAMME (NISEP).....	40
BUILDING REGULATIONS.....	44
CLIMATE CHANGE LEVY (CCL).....	52
CLIMATE CHANGE AGREEMENTS (CCA) .....	55
CRC ENERGY EFFICIENCY SCHEME.....	58
SMART METERING (Non-domestic) .....	61
ENERGY SAVING OPPORTUNITY SCHEME (ESOS) .....	64
SALIX PUBLIC SECTOR ENERGY EFFICIENCY LOAN SCHEME .....	67
GREENING GOVERNMENT COMMITMENT (GGC) .....	72
ENGLAND-WIDE ROLL OUT OF RE:FIT .....	75
RAIL ELECTRIFICATION .....	77
OFFICE FOR LOW EMISSION VEHICLES (OLEV) .....	79

## **CARBON EMISSIONS REDUCTION TARGET (CERT)**

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive.

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

The Carbon Emissions Reduction Target (CERT) placed an obligation on all domestic gas and electricity suppliers with more than a certain number of domestic customers. The customer thresholds were:-

- 50,000 domestic customers for 2008, 2009 and 2010;
- 250,000 domestic customers for 2011. Six energy suppliers were obligated under the scheme (British Gas, EDF Energy, E.ON, npower, Scottish Power, and SSE), with their share of the overall target based on their market share in each year of the obligation.

Obligated suppliers were expected to meet this target by promoting qualifying actions to household energy consumers. The qualifying actions were energy efficiency measures that would help householders to reduce the carbon footprint of their homes.

The scheme was administered by the energy regulator Ofgem, as the statutorily appointed administrator.

### **(b) target sectors;**

Domestic sector

### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

The overall CERT target for the period 1 April 2008 to 31 December 2012 was 293 million lifetime tonnes of CO<sub>2</sub><sup>10</sup>. This includes the extension made to CERT to extend the programme until 2012, the removal of certain measures (such as CFL lightbulbs), an insulation target and inclusion of a Super Priority Group.

Savings have been included based on measures installed between 2010 and 2012 with the impact of this action counted for the following years to 2023 as allowed under Article 7(7c). Savings are presented annually.

Suppliers were required to:-

- achieve 40 per cent of these savings via measures promoted to the Priority Group – people over 70 or on certain qualifying benefits
- achieve 73.4 million lifetime tonnes of CO<sub>2</sub> via professionally installed insulation measures

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<sup>10</sup> Actual emissions savings will be lower than notional savings due to comfort taking etc. The energy savings presented in Annex B are real savings estimates.

- achieve 16.2 million lifetime tonnes of CO<sub>2</sub> via measures promoted to members of the Super Priority Group (low income households on certain qualifying benefits).

Suppliers were either required to meet their obligations, or contract out the delivery required to meet the obligation to a third party (though the obligated party still remains liable for the obligation, even if they choose to contract out the delivery to a third party). The estimated real energy savings have been set out in Annex B.

**(d) the duration of the obligation period and intermediate periods;**

CERT ran between 1 April 2008 and 31 December 2012. Only savings from measures installed after 1 January 2010 have been included in the analysis for this Article.

**(e) eligible measure categories;**

A detailed list of eligible measures for all sub targets is available from the scheme regulator: <https://www.ofgem.gov.uk/ofgem-publications/58709/cert-supplier-guidance-v3.pdf> .

Post 2010, a significant proportion of the energy savings came from the installation of major energy efficiency measures such as loft insulation (including subsidised DIY insulation), solid wall and cavity wall insulation<sup>11</sup> .

Measure	Volume of measures installed (2010-12)
Cavity Wall insulation	1,575,283
Loft Insulation (professional)	2,690,197
Loft Insulation (DIY), m <sup>2</sup>	90,742,808
Solid Wall Insulation	36,304

Eligible measures under CERT have been selected to achieve carbon (and energy) savings in order for obligated suppliers to meet their obligations, and the UK, in turn, to meet its legally-binding carbon targets.

The assumed energy savings associated with each of these measures can be found on page 138 of the 2012 final stage ECO impact assessment. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf)

<sup>11</sup> These number are derived from the quarterly CERT Updates, produced by Ofgem, and available on their website <https://www.ofgem.gov.uk/environmental-programmes/energy-companies-obligation-eco/previous-energy-efficiency-schemes>

**(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The savings presented for this policy are considered deemed savings based on assumptions about the number and type of measures installed and what the typical household energy savings would be.

The measures installed under CESP are expected to be additional to business as usual, as previous evidence has suggested that Government intervention is the main driver of this type of energy efficiency improvements made in the UK<sup>12</sup>

An assessment of how the original CERT estimates were determined is set out in the original Impact Assessment<sup>13</sup> and then subsequent changes to the CERT Uplift and CERT Extension<sup>14</sup>. However, the methodology for calculating energy savings under CERT has since been revised, based on updated scientific evidence on energy savings delivered by energy efficiency measures installed under CERT, meaning the energy savings from measures are consistent with those presented in the ECO section, below.

**(g) lifetimes of measures;**

DECC's latest assumptions on the lifetime of measures is published on the Government's website

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69753/InformationSupplyChainFINAL.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69753/InformationSupplyChainFINAL.pdf)

The assumed lifetime of the large measures outlined in section (e), above, are:

<b>Measure</b>	<b>Assumed Lifetime</b>
Loft Insulation	42 years
Cavity Wall Insulation	42 years
Solid Wall Insulation	36 years

For each measure installed, the same in year energy savings are assumed, until the measure reaches the end of its lifetime (at which point the energy savings from that measure are assumed to fall to zero).

**(h) approach taken to address climatic variations within the Member State;**

Not applicable.

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<sup>12</sup>

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/350722/CERT\\_CESP\\_Evaluation\\_FINAL\\_Report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/350722/CERT_CESP_Evaluation_FINAL_Report.pdf) (see page 60).

<sup>13</sup> [http://www.legislation.gov.uk/uksi/2008/188/pdfs/uksem\\_20080188\\_en.pdf](http://www.legislation.gov.uk/uksi/2008/188/pdfs/uksem_20080188_en.pdf)

<sup>14</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/42587/899-ia-cert-role-appliances-consumer-electroni.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42587/899-ia-cert-role-appliances-consumer-electroni.pdf)

**(i) quality standards;**

The technical standards expected from eligible CERT measures were set out by the scheme's administrator Ofgem in their technical guidance, which can be found here: <https://www.ofgem.gov.uk/ofgem-publications/58721/tm-guidance.pdf>

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

The Government appointed Ofgem as the independent administrator for the CERT obligation. The CERT Order<sup>15</sup> details the Administrator's powers and functions under the CERT scheme.

In order to ensure that the reduction in carbon emissions estimated in relation to a notified action has actually been achieved, Ofgem had to be satisfied that the measures had been installed and conformed to the relevant quality standards.

The following monitoring was also required for certain actions:

- Technical monitoring of a sample of households of recipients was necessary for certain measures to ensure that the relevant quality standards have been met. Suppliers had to adopt appropriate quality standards with their project partners and contractors before commencing projects. Further guidance on the relevant technical standards and quality standards for common energy efficiency and micro generation measures is provided in Ofgem's Technical Guidance Manual.
- Customer satisfaction monitoring was required when installing measures such as heating and insulation in homes. It was not required when working in conjunction with a Social Housing provider as they were likely to be aware of any issues which may arise. Although it was not necessary to monitor satisfaction in relation to other actions, suppliers were encouraged to monitor consumer satisfaction over the course of the CERT so that they can offer the best possible service to consumers.
- Customer utilisation monitoring was required for certain measures such as free standby savers, to ensure that the measures were being used and that carbon emissions reductions are therefore being realised.
- Evaluation monitoring was required for two measures, real time displays and home energy advice. As these measures have been provided for in the Order with set carbon scores, this will enable Ofgem and DECC to monitor the savings resulting from the delivery of these measures.

In 2014, The Department of Energy and Climate Change also published an independent evaluation of the CERT scheme <https://www.gov.uk/government/publications/evaluation-of-the-carbon-emissions-reduction-target-and-community-energy-saving-programme>

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<sup>15</sup> <http://www.legislation.gov.uk/ukxi/2008/188/contents/made>

DECC is able to monitor the typical change in household energy use following the installation of measures through the National Energy Efficiency Data-framework (NEED) by matching metered energy consumption with installation records. This analysis has informed the policy evaluation<sup>16</sup>.

**(k) audit protocols;**

Ofgem audited a sample of each supplier's schemes under CERT. Auditing included, but was not be limited to, the following:

- That the proposed schemes were being delivered;
- There was evidence of the actions being performed, specifically the types and numbers of measures purchased by domestic customers or installed by the supplier, and that contracts are in place with any project partners identified
- There was accurate records management and audit trails of measures with no potential for double counting or otherwise misreporting of measures
- Risks of false reporting in the delivery chain was being managed and minimised;
- There was accurate monitoring of those in relation to whom actions are taken, to determine whether they were within the Priority Group, Super Priority Group or flexibility Priority Group;
- There was accurate monitoring and reporting to determine which actions were to be counted towards the Insulation Obligation; and procedures are in place for technical monitoring or for any other monitoring required for an action.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of CERT towards the UK Article 7 target is presented in Annex B

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<sup>16</sup> <https://www.gov.uk/government/collections/national-energy-efficiency-data-need-framework>

## COMMUNITY ENERGY SAVINGS PROGRAMME (CESP)

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

CESP placed an obligation on all domestic gas and electricity suppliers with more than a certain number of domestic customers and all licensed electricity generators that had generated on average 10 TWh/yr or more in a specified three year period. The customer thresholds for suppliers were 50,000 customers for 2009 and 2010, and 250,000 customers from 2011. It thus fell on the Big 6 energy suppliers (British Gas, EDF Energy, E.ON, npower, Scottish Power, and SSE) and four independent electricity generators (Drax Power, Eggborough Power, GDF Suez/ IPM, and Intergen).

CESP targeted households across Great Britain, in low income areas, to improve energy efficiency standards, and reduce fuel bills. 4,500 areas were eligible for CESP.

In England, the lowest 10 per cent of areas ranked using the Index of Multiple Deprivation (IMD)<sup>17</sup> qualified and in Scotland<sup>18</sup> and Wales<sup>19</sup> the lowest 15 per cent of areas qualified.

Information on eligible areas is contained in the Communities: areas of low income document [http://www.official-](http://www.official-documents.gov.uk/document/other/9780108508417/9780108508417.pdf)

[documents.gov.uk/document/other/9780108508417/9780108508417.pdf](http://www.official-documents.gov.uk/document/other/9780108508417/9780108508417.pdf)

CESP promoted a “whole house” approach i.e. a package of energy efficiency measures best suited to the individual property. The programme was delivered through the development of community-based partnerships between Local Authorities (LAs), community groups and energy companies, via a house-by-house, street-by-street approach. This partnership working allowed CESP to be implemented in a way that is best suited to individual areas and coordinated with other local and national initiatives.

The scheme was administered by the energy regulator Ofgem, as the statutorily appointed administrator.

Suppliers were either required to meet their obligations, or contract out the delivery required to meet the obligation to a third party (although the obligated party still remains liable for the obligation, even if they choose to contract out the delivery to a third party).

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<sup>17</sup> Details of the English Index of deprivation can be found here:

<https://www.gov.uk/government/collections/english-indices-of-deprivation>.

<sup>18</sup> Details of Scotland’s index of deprivation can be found here:

<http://www.scotland.gov.uk/Topics/Statistics/SIMD>

<sup>19</sup> Details of Wales’s index of deprivation can be found here:

<http://wales.gov.uk/statistics-and-research/welsh-index-multiple-deprivation/?lang=en>

**(b) target sectors;**

Domestic sector

**(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

The overall CESP target for the period 1 October 2009 to 31 December 2012 was 19.25 million lifetime tonnes of carbon dioxide (Mt CO<sub>2</sub>). This comprised a target of 9.625 Mt CO<sub>2</sub> for suppliers and 9.625 Mt CO<sub>2</sub> for generators<sup>20</sup>.

Savings have only been included based on measures installed between 2010 and 2012 with the impact of this action counted for the following years to 2023 as allowed under Article 7(7c). Savings are presented annually.

Suppliers were either required to meet this obligation themselves, or contract the obligation out to a third party that could deliver the obligation on their behalf. The estimated real energy savings have been set out in Annex B.

**(d) the duration of the obligation period and intermediate periods;**

Suppliers and generators were to meet their obligations between 1 October 2009 and 31 December 2012. Only measures installed after 1 January 2010 have been included in the savings presented.

**(e) eligible measure categories;**

A detailed list of eligible measures for all sub targets is available from the scheme regulator: <https://www.ofgem.gov.uk/ofgem-publications/58791/cesp-generator-and-supplier-guidance.pdf>

Post 2010, a significant proportion of the energy savings came from the installation of major energy efficiency measures such as loft insulation (including subsidised DIY insulation), solid wall and cavity wall insulation<sup>21</sup>.

Measure	Volume Installed (2010-2012)
Loft Insulation (professional)	23,503
Solid Wall Insulation	80,257
Replacement Boilers	42,898

Eligible measures under CERT have been selected to achieve carbon (and energy) savings in order for obligated suppliers to meet their obligations, and the UK, in turn, to meet its legally-binding carbon targets.

The assumed energy savings associated with each of these measures can be found on page 138 of the 2012 final stage ECO impact assessment. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf)

<sup>20</sup> Actual emissions savings will be lower than notional savings due to comfort taking etc. The energy savings presented in Annex B are real savings estimates.

<sup>21</sup> These number are derived from the quarterly CESP Updates, produced by Ofgem, and available on their website <https://www.ofgem.gov.uk/environmental-programmes/energy-companies-obligation-eco/previous-energy-efficiency-schemes>

**(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The savings presented for this policy are considered deemed savings. An assessment of how the CESP energy savings were estimated is set out in the 2009 Impact Assessment. However, the methodology for calculating energy savings under CESP has since been revised and the savings presented in Annex B are based on updated scientific evidence on energy savings delivered by energy efficiency measures installed under CESP meaning the energy savings from measures are consistent with those presented in the ECO section below.

The scheme rules for determining the contribution that a particular measure makes towards a supplier's or generator's target are set out in article 23 and Schedule 3 of the Electricity and Gas (Community Energy Saving Programme) Order 2009<sup>22</sup> (the "CESP Order").

The measures installed under CESP are expected to be additional to business as usual, as previous evidence has suggested that Government intervention is the main driver of this type of energy efficiency improvements made in the UK<sup>23</sup>

**(g) lifetimes of measures;**

DECC's latest assumptions on the lifetime of measures is published on the Government's website  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69753/InformationSupplyChainFINAL.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69753/InformationSupplyChainFINAL.pdf)

Details on the lifetime of measures installed under CESP which are not eligible under the Green Deal can be found in the CESP impact assessment  
The most common measures are:

<b>Measure</b>	<b>Assumed Lifetime</b>
Loft Insulation	42 years
Solid Wall Insulation	36 years
Replacement Boilers	12 years

For each measure installed, the same in year energy savings are assumed, until the measure reaches the end of its lifetime (at which point the energy savings from that measure are assumed to fall to zero).

**(h) approach taken to address climatic variations within the Member State;**

Not applicable.

**(i) quality standards;**

The CESP Order defined eligible measures under the scheme  
[http://www.legislation.gov.uk/ukdsi/2009/9780111481929/pdfs/ukdsi\\_9780111481929](http://www.legislation.gov.uk/ukdsi/2009/9780111481929/pdfs/ukdsi_9780111481929.pdf)

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<sup>22</sup> <http://www.legislation.gov.uk/ukdsi/2009/1905/contents/made>

<sup>23</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/350722/CERT\\_CESP\\_Evaluation\\_FINAL\\_Report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/350722/CERT_CESP_Evaluation_FINAL_Report.pdf) (see page 60).

[9\\_en.pdf](#), while the Carbon Emissions Reduction Target (CERT) Technical Guidance Manual <https://www.ofgem.gov.uk/ofgem-publications/58721/tm-guidance.pdf> specified the technical and quality standards under both CERT and CESP<sup>24</sup>

In order to ensure that the reduction in carbon emissions in relation to a completed action had been achieved, Ofgem had to be satisfied that the measures had been installed and conformed to the relevant quality standards (see section 'J' below for more information).

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

The CESP Order

[http://www.legislation.gov.uk/ukdsi/2009/9780111481929/pdfs/ukdsi\\_9780111481929\\_en.pdf](http://www.legislation.gov.uk/ukdsi/2009/9780111481929/pdfs/ukdsi_9780111481929_en.pdf) details the Administrator's powers and functions under the CERT scheme.

Furthermore, Ofgem specified the following monitoring for certain actions:

- Technical monitoring of a sample of households was necessary for certain measures to ensure that the relevant quality standards were met. Suppliers and generators had to adopt appropriate quality standards with their project partners and contractors before commencing projects. Further guidance on the relevant technical and quality standards for common energy efficiency and micro-generation measures is provided in the CERT Technical Guidance Manual.
- Customer satisfaction monitoring was required when installing measures such as heating and insulation in homes. It was not required when working in conjunction with Social housing providers as they are likely to be aware of any issues which may arise. Although it was not necessary to monitor satisfaction in relation to other actions, suppliers and generators were encouraged to monitor consumer satisfaction over the course of CESP so that they could offer the best possible service to consumers, and
- Customer utilisation and evaluation monitoring were required for home energy advice to ensure that the measures were being used and that carbon emissions reductions were therefore being realised.
- Suppliers and generators had to provide a summary of the monitoring results and sample customer satisfaction, quality monitoring and evaluation monitoring questionnaires as relevant.
- Once Ofgem received a notification under article 22 of the Order it determined the reduction in carbon emissions resulting from the completed action.

In 2014, The Department of Energy and Climate Change also published an independent evaluation of the CESP scheme

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<sup>24</sup> Technical and quality standards required in CESP were the same as those in CERT

<https://www.gov.uk/government/publications/evaluation-of-the-carbon-emissions-reduction-target-and-community-energy-saving-programme>

**(k) audit protocols;**

Each energy company that has set up schemes to comply with its obligation was audited. Under article 19 of the CESP Order, suppliers and generators were obliged to provide Ofgem with information that it reasonably required in relation to compliance with their CESP obligation.

Ofgem appointed an independent auditor to carry out audits during the period of the Order. Auditing ascertained whether:

- a) the proposed actions were delivered as notified under article 16(1) of the Order
- b) procedures were put in place for technical and other monitoring required for that action and that the quality of installation was maintained, and
- c) there was a clear distinction between actions reported through CESP and other programmes and what safeguards suppliers had put in place to make this distinction.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of CESP towards the UK Article 7 target is presented in Annex B

## ENERGY COMPANY OBLIGATION (ECO)

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

The ECO places an obligation on energy suppliers that have more than 250,000 domestic customer accounts and supply more than certain specified amounts of electricity or gas. Details of these ECO obligation thresholds are available in the guidance document from Ofgem (the ECO scheme administrator):

<https://www.ofgem.gov.uk/publications-and-updates/energy-companies-obligation-eco-guidance-suppliers-version-1.1-0>

The scheme is run by the energy regulator Ofgem.

### **(b) target sectors;**

Domestic sector

### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

The ECO target to 31 March 2015, consist of three separate targets that were to be met by 31 March 2015:

- The Carbon Emissions Reduction Obligation (CERO) target: 20.9 MtCO<sub>2</sub> lifetime savings
- The Carbon Saving Communities (CSCO) target: 6.8 MtCO<sub>2</sub> lifetime savings
- The Affordable Warmth (AW) target: £4.2bn reduction in lifetime notional space and water heating costs

However, in 2014, several changes were made to the ECO targets in legislation, including a 33% reduction in the CERO target to 31 March 2015 and an uplift mechanism to reward those companies that delivered early under CERO<sup>25</sup>); the scheme was also extended from April 2015 to 31 March 2017 The targets for this period are lifetime savings of 12.4MtCO<sub>2</sub> for CERO and 6.0MtCO<sub>2</sub> for CSCO. The Affordable Warmth target has been set on the basis of a pro-rata of the original estimated cost of the policy i.e. £350m per annum of the scheme extension (in 2011 prices). This leads to a target of £3.7bn of lifetime notional bill savings. Previous analysis presented in June 2014 assumed that the scheme would continue until then.

The proposed changes to the design of ECO reflect our commitment to helping consumers manage the cost of their bills, and will reduce the target for the carbon-saving element of ECO, and help households install cheaper energy efficiency measures such as loft and standard cavity wall insulation in their homes-

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<sup>25</sup> Under the levelisation mechanism, companies that delivered more than a certain threshold of their obligation by the end of March 2014 would receive an uplift to the ECO score on those measures. The effect of this is to reduce the actual CERO carbon target ambition that the companies have to delivery (beyond the 33% straight reduction). The impact of the levelisation mechanism is captured in our estimated savings in the published assessments and this return.

The estimated energy savings have been set out in Annex B. Savings have been included based on measures installed between 2013 and 2022 with the impact of this action counted through to 2023 as allowed under Article 7(7c). Savings are presented annually.

**(d) the duration of the obligation period and intermediate periods;**

The current legally binding ECO targets are for the period from 1 January 2013 to 31 March 2017.

**(e) eligible measure categories;**

A range of domestic heating and insulation measures, but the list of eligible measures varies between the three sub-targets. The current list of eligible measures for all sub targets is available from the scheme administrator:

<https://www.ofgem.gov.uk/ofgem-publications/83100/copyofecomeasurestable-mar2014url.pdf>

The main eligible insulation measures are Solid Wall Insulation, Cavity Wall Insulation and Loft Insulation. Under the Affordable Warmth target, a range of heating technologies are also eligible, including boiler repairs and replacements.

**(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The savings presented for this policy are considered deemed savings based on assumptions about what the actual savings observed for the measures installed.

The *expected savings* are estimated using two DECC models: the 'Green Deal Household Model' and the 'Affordable Warmth Model'. The Green Deal Household Model is a housing stock model that stimulates the uptake of energy efficiency measures each year. The Affordable Warmth Model models the delivery of insulation and heating measures to a sub-set of the housing stock.

Both models use data (where available) on the actual measures that have been installed to date to calibrate estimates of future delivery of measures; both of the models' energy savings are also calibrated to the UK's Standard Assessment Procedure (SAP)<sup>26</sup>, adjusted for differences between the SAP estimates and observed energy savings .

Moreover, the models only count measures that are expected to be additional to those installed in the absence of the policy<sup>2728</sup>. Within affordable warmth, we assume that 60% of households use an electric room heater to heat their home when their boiler breaks. The remaining 40% is assumed to continue to use their inefficient

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<sup>26</sup> <https://www.gov.uk/standard-assessment-procedure>

<sup>27</sup> Specifically the models estimate the uptake to self-financed measures, and net these off the reported number of measures attributed to the policy. Uptake of measures in the absence of the policy is expected to be small, however, as the government policies are believed to drive the majority of energy efficiency installations (see, for example, Section 6 of the CERT evaluation <https://www.gov.uk/government/publications/evaluation-of-the-carbon-emissions-reduction-target-and-community-energy-saving-programme>).

<sup>28</sup> To avoid double counting under the scheme, for new builds and major renovations Ofgem only awards savings if they are over-and-above building regulations.

boiler. Whilst there is uncertainty around this assumption it is based on this heating pattern being observed by Warm Front customers (a previous fuel poverty policy) who had a broken boiler.

Statistics reporting delivery of measures through the Energy Company Obligation are summarised below:

### Summary of measures installed under Energy Company Obligation

	2013	2014	TOTAL
Boiler	167,297	116,887	284,184
Other Heating	30,346	53,441	83,787
Cavity wall insulation	172,162	320,945	493,107
Loft Insulation	129,540	216,018	345,558
Solid Wall Insulation	27,518	49,108	76,626
Other Insulation	1,768	8,973	10,741
Window Glazing	255	2,183	2,438
<b>All measures</b>	<b>528,886</b>	<b>767,555</b>	<b>1,296,441</b>

Source: DECC National Statistics<sup>29</sup>

Regular reports on the measures installed and deemed savings are published monthly. <https://www.gov.uk/government/collections/green-deal-and-energy-company-obligation-eco-statistics>

The energy savings derived from these measures are reported in Annex X alongside the savings from alternative measures.

See the Green Deal and ECO 2012 Final Impact Assessment annexes for further details on the models and the analysis underpinning the expected savings from insulation measures in this return for the period beyond 2017.

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf)

The analysis underpinning the expected savings in this return from insulation measures for the period from 2013 to 2017 (and heating measures for the whole period) is set out in The Final Stage Impact Assessment on the Future of the Energy Company Obligation

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/373650/ECO\\_IA\\_with\\_SoS\\_e-sigf\\_v2.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/373650/ECO_IA_with_SoS_e-sigf_v2.pdf)

ECO requires savings for CERO and CSCO targets to be calculated in accordance with the national assessment methodologies SAP or RdSAP, with an “in-use factor” applied in addition to reflect the Government’s estimate of the likely performance of

<sup>29</sup> <https://www.gov.uk/government/statistics/green-deal-and-energy-company-obligation-eco-monthly-statistics-february-2014>

<https://www.gov.uk/government/statistics/green-deal-and-energy-company-obligation-eco-monthly-statistics-february-2015>

energy efficiency measures when installed in properties. ECO requires savings for the AW target to be calculated in accordance with SAP or RdSAP<sup>30</sup>.

In a case where SAP or RdSAP methodologies do not cover a particular measure, a supplier can ask Ofgem to approve an alternative appropriate methodology for calculating estimated savings.

**(g) lifetimes of measures;**

This varies by measure.

Our assumptions on the lifetime of measures underpinning the expected savings in this return are set out in DECC's 2012 Impact Assessment (see p. 159)

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf)

The expected lifetimes of *all* ECO eligible measures are provided by Ofgem (see

<https://www.ofgem.gov.uk/ofgem-publications/83100/ecomeasurestable03102013.pdf> ).

The lifetimes for the main insulation measures are:

Solid Wall Insulation: 36 years

Cavity Wall Insulation: 42 years

Loft Insulation: 42 years

Condensing Boilers: 12 years

A full list of measures, including expected lifetimes and In-use-factors can be found here

<https://www.ofgem.gov.uk/ofgem-publications/83100/energycompaniesobligation-measures-pdf>

The energy saving impact estimated in our assessments, and in this return, are based on the measure lifetimes set out above<sup>31</sup>.

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<sup>30</sup> The legal ECO targets noted in paragraph (f) represent *notional* carbon and bill savings, since under ECO, the scoring mechanism sometimes applies an uplift factor to the "objective" carbon and bill savings score of a measure to support other policy objectives (such as encouraging early delivery, or delivery to certain types of vulnerable recipients). In reporting carbon and bill savings to the Commission the UK takes account of these factors, as well adjusting the savings that would have occurred in the absence of ECO, and the need to adjust scores to reflect the effect of the ECODesign Directive

<sup>31</sup> However, note that only the energy savings to 2023 are reported in the return. For example, if a solid wall is installed in 2020 with a lifetime of 36 years, only the energy savings from the first three years (to 2023) are reported in this return

**(h) approach taken to address climatic variations within the Member State;**

Not applicable.

The UK methodology for dwellings SAP<sup>32</sup> applies one set of climate data (temperature, degree day) for assessment of new dwellings but considers regional factors such as insolation (solar radiation).

**(i) quality standards;**

To be counted towards ECO, obligated energy suppliers should ensure that the installation of a measure is carried out in accordance with the relevant quality standards, including Building Regulations, and the Publicly Available Specification 2030:2014 Edition 1 (PAS) (where the measure is included in PAS). PAS sets out requirements that installers will follow to ensure that the installation of energy efficiency measures effected pursuant to the ECO and Green Deal schemes is completed properly, including governance, training requirements, pre-installation surveys, installation requirements and competence requirements (see <http://shop.bsigroup.com/en/Browse-by-Sector/Building--Construction/The-Green-Deal/>).

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

Government has appointed Ofgem (the independent electricity and gas regulator) as the administrator for the overall ECO obligation period. The ECO Order details the Administrator's powers and functions in respect of the ECO scheme. These functions include to: approve appropriate methodologies for suppliers to calculate carbon or cost savings; attribute savings to completed qualifying action; determine whether a supplier has achieved its total obligation for each of the obligations under ECO (CERO, CSCO and HHCRO); submit a report to the SoS each month, detailing the progress which suppliers have made towards achieving their obligations; submit a report to the SoS after the end of the overall obligation period, detailing whether suppliers achieved the overall targets set for each obligation under ECO, and; require information or evidence from suppliers, including information relating to the cost to the supplier of achieving its obligations.

Ofgem provide guidance including an operation toolkit to help Obligated parties/members of the supply chain in ensuring they understand their roles and responsibilities. This includes information about the processing and validation checks for measures. <https://www.ofgem.gov.uk/environmental-programmes/energy-company-obligation-eco/eco-guidance>

Ofgem requires obligated suppliers to conduct technical monitoring of a 5% sample of notified measures (more than a statistically significant level). Technical monitoring is focussed on the standards of installation of measures and the inputs to the SAP/RdSAP scoring calculation to ensure that reported savings are accurate. Technical monitoring must be undertaken by a suitably qualified third party, who is independent from the supplier, installer, or any other party involved in the installation of the measure.

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<sup>32</sup> <http://www.bre.co.uk/sap2009/>

For some types of ECO measure, DECC is able to monitor the typical change in household energy use following the installation of measures through the National Energy Efficiency Data-framework (NEED) by matching metered energy consumption with installation records<sup>33</sup>.

**(k) audit protocols;**

In addition to technical monitoring requirements (see above) Ofgem conducts risk-based targeted audits on some measures that are notified to them by a supplier. An audit may look at any or all aspects of the promotion of the measure, including the processes and governance of the obligated energy companies. The purpose of an audit will be to determine whether the information that a supplier has provided about the promotion of a measure is accurate. All aspects of supplier activity under ECO could be subject to audit – following an audit, the supplier will be issued with a full audit report and recommendations to ensure compliance with ECO.

Where an audit of a notified measure establishes that certain information provided to Ofgem is not accurate, Ofgem may:

1. revoke an earlier decision to attribute savings to the measure;
2. consider taking enforcement action under our powers; and
3. initiate further auditing or monitoring of the supplier, if the results of the earlier audit indicate an area of risk in relation to that supplier.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of ECO towards the UK Article 7 target is presented in Annex B

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<sup>33</sup> <https://www.gov.uk/government/collections/national-energy-efficiency-data-need-framework>

## GREEN DEAL

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

**(a) obligated, participating or entrusted parties, or implementing public authorities; Implementing public authority:**

Obligated / participating / entrusted parties: Energy Suppliers; Green Deal providers; Green Deal assessors; Green Deal installers; Green Deal Finance Company.

Administration on behalf of the Department of Energy and Climate Change (DECC) is run by the Green Deal Oversight and Registration Body (GD ORB) and the UK Accreditation Service (UKAS) (in relation to the Publicly Available Specification (PAS) 2030 and 2031 concerning installing energy efficiency measures and assessments).

**(b) target sectors;**

Domestic and non-domestic buildings

**(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

The estimated energy savings have been set out in Annex B.

**(d) the duration of the obligation period and intermediate periods;**

The Green Deal was launched in January 2013 and has been established as a long term policy. Savings have been included based on measures installed between 2014 and 2020 with estimated savings presented in each year.

**(e) eligible measure categories;**

Energy efficiency measures that can be taken through Green Deal are set out in this document

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/48406/5504-which-energy-efficiency-improvements-qualify-for-g.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48406/5504-which-energy-efficiency-improvements-qualify-for-g.pdf)

**(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The savings presented for this policy are considered deemed savings. The expected savings are estimated using two DECC models: the Green Deal Household Model and the Non-Domestic Green Deal Model. See Green Deal and ECO 2012 Final Impact Assessment annexes for further details:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf)

In 2014, DECC launched a new Green Deal Home Improvement Fund, an incentive scheme open to all householders in England and Wales that will help support the installation of energy efficiency measures such as solid wall insulation and new heating systems. The scheme has stimulated domestic demand for Green Deal measures. As well as supporting the projected energy savings estimated in Annex B,

much of the energy savings generated from the scheme will be additional to current domestic Green Deal estimates (which only cover the main insulation measures, and not measures such as boilers, double glazing etc). However, they have not yet been estimated to included in the savings in Annex B. The same principle applies for the recently launched Green Deal Communities scheme.

As outlined in the next section, the Government will, from April 2018, require domestic and non-domestic rented properties in England and Wales to meet minimum energy efficiency standards. It is anticipated that the Green Deal would be used to deliver improvements needed for landlords to comply with these regulations.

Please note that the energy savings presented under Green Deal exclude savings where Green Deals are blended with the Energy Company Obligation (ECO), the energy savings are attributed wholly to the latter policy<sup>34</sup>. This, along with the fact that the energy savings from Green Deal led schemes such as GD HIF (described above) have not yet been estimated, means that the total energy savings from the Green Deal are likely to be higher than those presented under the Green Deal at this time.

**(g) lifetimes of measures;**

This varies by measure.

Our assumptions on the lifetime of measures underpinning the expected savings in this return are set out in DECC's 2012 Impact Assessment (see p. 159)

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf)

The expected lifetimes of *all* ECO eligible measures are provided by Ofgem (see

<https://www.ofgem.gov.uk/ofgem-publications/83100/ecomeasurestable03102013.pdf> ).

The lifetimes for the main insulation measures are:

Solid Wall Insulation: 36 years

Cavity Wall Insulation: 42 years

Loft Insulation: 42 years

**(h) approach taken to address climatic variations within the Member State;**

not applicable

**(i) quality standards;**

Installations must meet the quality standard set out in the PAS 2030. This specification sets out requirements that installers will follow to ensure that the installation of new energy efficiency measures effected pursuant to the Green Deal scheme is completed properly (see <http://shop.bsigroup.com/en/Browse-by-Sector/Building--Construction/The-Green-Deal/>).

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<sup>34</sup> It is not possible to disaggregate the energy savings from the Green Deal where blending with ECO has occurred.

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

A monitoring strategy is in place to ensure obligated / participating / entrusted parties adhere to the requirements and standards set out in legislation, by UKAS, and the Green Deal Code of Practice, by the GD ORB.

The GD ORB, who administer the Green Deal on behalf of the implementing public authority, monitor Providers and Certification Bodies to the Code of Practice.

UKAS monitors and ensures that Certification Bodies are meeting the requirements set out in PAS 2031 and PAS 2030. In turn, Certification Bodies certify and monitor Assessors and Installers.

Where non-compliance with the requirements and standards set out in legislation and the Green Deal Code of Practice is identified, action will be taken by the GD ORB. Action includes notification to the implementing public authority, investigation by the Green Deal Ombudsman and Investigation Service, and issuing of sanctions as set out in the legislation.

Where non-compliance to PAS 2031 is found, UKAS will investigate and /or implement sanctions/corrective actions on Certification Bodies. If they still fail to comply, UKAS will notify the GD ORB, who will investigate and carry out actions as set out above.

**(k) audit protocols;**

Desktop audits of each Green Deal Provider are carried out by the GD ORB at least annually, and site visits are carried out at least every two years, against all the requirements in the legislation and the Green Deal Code of Practice. Additional monitoring will take place if the Provider is non-compliant, as a result of complaints or other intelligence gathered.

The GD ORB has the same arrangements in place for Certification Bodies in relation to the Code of Practice, although desktop audits are at least every two years and site visits at least every three.

UKAS carry out an initial assessment of certification bodies for authorisation and then annual inspections. These are both through site visits and desktop audits of systems.

Certification Bodies are responsible for the ongoing surveillance of Assessors and Installers against the requirements in the legislation and the Green Deal Code of Practice. This can be through desktop audits, on-site inspections or witnessed activities. In addition, Assessors are monitored against the requirements in the legislation and the Green Deal Code of Practice; and Installers against PAS 2030 for the measures they install. Certification Bodies also have responsibility for investigating complaints and potential breaches referred to them, which can trigger additional monitoring and action against non-compliant certified organisations.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of Green Deal towards the UK Article 7 target is presented in Annex B. Savings from domestic and non-domestic have been shown separately.

## **PRIVATE RENTED SECTOR (PRS) REGULATIONS: ENGLAND AND WALES**

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

Landlords owning domestic and non-domestic private rented sector properties. In 2014, the Government consulted on secondary legislation for proposed minimum energy efficiency standards for domestic and non-domestic private rented sector (PRS) properties in England and Wales (known as the Private Rented Sector Regulations)<sup>35</sup>. Following the consultation, the Regulations were made in March 2015.

The Regulations mean that:

- From 1st April 2016, landlords of a domestic PRS property may not unreasonably refuse requests from their tenants for consent to energy efficiency improvements, where finance is available that ensures no upfront or net costs to landlords for the measures.
- From 1st April 2018, domestic and non-domestic PRS properties cannot be let unless they have at least an E EPC rating. To ensure there are no upfront or net costs to landlords, a landlord may be permitted to let a property below the minimum standard where they undertake all improvements possible within the Green Deal's Golden rule, taking into account Green Deal finance, ECO or grant funding that may be available. Other safeguards and exemptions also apply.

The Government's response to the consultation, and accompanying impact assessment (which underpins the energy savings reported in this return) can be found on the Government's website:

Domestic: <https://www.gov.uk/government/consultations/private-rented-sector-energy-efficiency-regulations-domestic>

Non-Domestic: <https://www.gov.uk/government/consultations/private-rented-sector-energy-efficiency-regulations-non-domestic>

### **(b) target sectors**

The policy is primarily aimed at improving the energy performance of the least energy efficient properties in the domestic and non-domestic private rented sector.

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<sup>35</sup> The primary powers were contained within the Energy Act 2011  
<http://www.legislation.gov.uk/ukpga/2011/16/contents/enacted>

**(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

There is no set target for energy savings under the PRS Regulations. The level of energy savings achieved will depend upon (a) the number of tenants who make requests for their landlords' consent to energy efficiency improvements, and (b) the proportion of properties in scope that are improved to an E EPC rating, or as close to an E as possible, with support from the relevant financing and funding schemes.

The estimated savings from action prompted by these Regulations are set out in Annex B.

**(d) the duration of the obligation period and intermediate periods;**

The dates when the obligations start are as set out in part (a), above. The impact assessment accompanying the Government's consultation response on the secondary legislation discusses the detail regarding how and when the Regulations will impact properties within the PRS<sup>36</sup>. Savings are included in Annex B up to 2020.

**(e) eligible measure categories;**

Any measures listed in the Schedule to the Green Deal (Qualifying Energy Improvements) Order 2012, or any measure which is installed for the purposes of connecting the property to the gas grid..

**(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The savings presented for this policy are considered deemed savings based on estimates derived from two DECC models, the National Household Model (NHM) and the Non Domestic PRS model (ND PRS). While some of the action taken will be delivered through Green Deal savings driven by PRS are included in Annex B under PRS and are not included under Green Deal.

Estimated uptake of energy efficiency measures within the NHM is modelled by taking the following steps:

(i) The PRS Regulations drive a proportion of landlords owning domestic PRS properties, and tenants renting those properties, to consider taking out a Green Deal each year.

(ii) For each property, every physically possible combination of measures, limited to a maximum of four measure per package, is evaluated.

- a. The total costs and energy savings are calculated, and the NHM tests whether these costs and benefits pass the Golden Rule for Green Deal. If they do not, the package is discarded.
- b. The NHM then finds the package of measures that minimises costs of reaching an 'E' rating.

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36

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/401379/150202\\_PRS\\_Final\\_Stage\\_Revised\\_For\\_Publication.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/401379/150202_PRS_Final_Stage_Revised_For_Publication.pdf)

(iii) Where measures can be installed under the Golden Rule, but the property cannot reach an 'E', the National Household Model installs the package of measures that maximises the improvement in energy efficiency of the property whilst still meeting the Golden Rule.

(iv) If no energy efficiency measures can be made that meet the Golden Rule, no measures are installed, and the landlord is granted a temporary exemption.

Energy Savings are based on the UK's Standard Assessment Procedure (SAP)<sup>37</sup>, adjusted to take into differences between the energy savings assumed by SAP, and those observed in reality.

The Non-domestic PRS model estimates the uptake of cost-effective energy efficiency measures throughout the non-domestic private rental sector by defining a mix of premises typologies within the non-domestic PRS and allocated cost-effective measures to these different premises, based on a combination of EPC recommendations for those premises and BRE data.

Energy savings are calculated based on the Building Research Establishment's Simplified Building Energy Model (SBEM)<sup>38</sup>

The profile of take up in the counterfactual in the domestic sector has been determined from modelling in the Green Deal Household Model (GDHM), whilst the non-domestic counterfactual is based on research underpinning the non-domestic green deal model, both referenced in the Green Deal and ECO 2012 Final Impact Assessment annexes<sup>39</sup>.

**(g) lifetimes of measures;**

DECC's latest assumptions on the lifetime of measures is published on the Government's website

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69753/InformationSupplyChainFINAL.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69753/InformationSupplyChainFINAL.pdf)

According to our analysis, the most common measures for the domestic sector are expected to be:

<b>Measure</b>	<b>Assumed Lifetime</b>
Loft Insulation	42 years
Low Energy Light bulbs	10 years
Cavity Wall Insulation	42 years
Hot Water Cylinder Insulation	10 years

<sup>37</sup> <https://www.gov.uk/standard-assessment-procedure>

<sup>38</sup> <http://www.bre.co.uk/page.jsp?id=706>

<sup>39</sup> See attached link for further details:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf)

And in the non-domestic sector:

<b>Measure</b>	<b>Assumed Lifetime</b>
Condensing Boilers	12 years
Air source heat pump.	20 years

**(h) approach taken to address climatic variations within the Member State;**

The UK methodology for dwellings (SAP<sup>40</sup>) applies average UK data for heating load assessment and regional factors for solar radiation and cooling loads.

**(i) quality standards;**

Measures required to be installed are limited to those listed in the Schedule to the Green Deal (Qualifying Energy Improvements) Order 2012, and measures installed for the purposes of connecting a property to the gas grid.

When a tenant makes a request for consent for energy efficiency improvements under the Regulations, the installation of those improvements must be undertaken by a person who meets the relevant installer standards..

Where works are paid for by a Green Deal finance plan, only an authorised Green Deal Installer can install energy efficiency improvements. Additionally, only authorised installers can identify themselves as 'Green Deal Installers' and use the Green Deal Quality Mark.

Authorised Green Deal installers must:

- Be part of a company that is certified by a Certification Body as meeting the Publicly Available Specification (PAS) 2030 for the measures they wish to install. Both the individual and company are required to meet the relevant requirements of PAS 2030. Certification bodies will certify installer organisations against the relevant parts of the PAS standard. It is then the responsibility of the certified organisation to ensure their employees meet the relevant standards;
- Comply by the conditions as detailed in the Green Deal Code of Practice on the DECC and Green Deal Oversight and Registration Body websites;
- Keep clear records of work done and allow monitoring of installation work when requested.

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<sup>40</sup> <http://www.bre.co.uk/sap2009/>

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

The Regulations state that local authorities will be the enforcement body for the domestic sector, and local weights and measures authorities will be the enforcement body for the non-domestic sector. These enforcement bodies will determine whether and when a civil penalty should be imposed. Any penalty notice must be reviewed by the enforcement body at the landlord's request, and in the event of a dispute, the matter may be referred to a Tribunal.

**(k) audit protocols;**

Local authorities are required to enforce in the domestic sector, and local weights and measures authorities are required to enforce in the non-domestic sector; this enforcement is alongside their existing policing of Energy Performance Certificates. This may include issuing compliance notices to request further information considered necessary to confirm compliance, or using data held centrally on Landlord registered exemptions to the PRS regulations.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of the PRS Regulations towards the UK Article 7 target is presented in Annex B

## **PRIVATE & SOCIAL REGULATION: SCOTLAND**

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

**Summary:** Social landlords are already required to meet the Scottish Housing Quality Standard by 2015, and this includes an energy efficiency element. We introduced a new energy efficiency standard for social housing in 2014 setting initial targets to be met by 2020. This will further improve the energy efficiency of social housing, reducing energy consumption and fuel poverty and driving down emissions.

As well as introducing a new Energy Efficiency Standard for Social Housing, we are working with stakeholders to develop draft minimum standards for the energy efficiency of private housing for consultation in spring 2015.

The Scottish Government is facilitating a stakeholder working group to look at setting minimum standards for all private sector housing.

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

Scottish Local Authorities; Registered Social Landlords; Private landlords; private owners

### **(b) target sectors;**

All social and private sector housing

### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

Energy savings are provided in Annex B. These are presented as annual savings over the seven year period 2014-20.

### **(d) the duration of the obligation period and intermediate periods**

The Energy Efficiency Standard for Social Housing was introduced in 2012 and is due to run until 2027. Savings have been included based on impact between 2014 and 2020.

Private sector – date for introduction of any standards to be determined following consultation

### **(e) eligible measure categories;**

A range of domestic heating, insulation and renewables.

**(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

Expected savings are considered as deemed savings and are calculated using the Domestic Energy Model for Scotland (DEMScot). Modelling is based on building stock database abstracted from the Scottish House Condition Survey, building physics parameters and Scottish weather variables. It models total energy use including space and water heating, cooking, lighting and appliances. Model shows the effect that implementing upgrades has on energy use and GHG emissions. We assume a rebound effect of 15% of all energy savings.

**(g) lifetimes of measures;**

Not applicable

**(h) approach taken to address climatic variations within the Member State;**

These regulations are specifically for Scotland

**(i) quality standards;**

Social landlords are primarily responsible for ensuring they procure and install works that meet their own quality requirements and appropriate regulatory standards. Similarly in the private sector, landlords and owners would be responsible for ensuring appropriate quality standards.

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

EESSE – Compliance with this standard will be monitored by the independent Scottish Housing Regulator (SHR). The SHR will provide annual reports on progress against the target by all social landlords.

Private sector – the consultation on draft regulations will include arrangements for how the standards would be enforced

**(k) audit protocols;**

See under (j)

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of private & social housing regulation towards the UK Article 7 target is presented in Annex B

## HOME ENERGY EFFICIENCY PROGRAMMES: SCOTLAND

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

**Summary:** The Home Energy Efficiency Programmes Scotland, launched in April 2013, will help to refit or refurbish existing homes to make them more energy efficient. The core of the programme will be local authority developed, area-based strategies, aimed initially at fuel poor areas. HEEPS also provides national schemes – Affordable Warmth Scheme and the Energy Assistance Scheme – to provide for the most vulnerable households wherever they live. These two schemes are due to end in April 2015 and will be replaced with a new national HEEPS scheme with a potential value of £224m over 7 years. Spending on domestic energy efficiency of, £94m in 2014/15, rising to £114m in 2015/16, has already made hundreds of thousands of homes warmer and cheaper to heat. HEEPS is used to leverage in energy supplier funding under the Energy Companies Obligation (ECO). Savings reported here are additional to those presented for ECO.

A new Scottish Energy Efficiency Loan scheme was launched in April 2015, which will provide low-cost loans to households, helping cover the upfront costs of energy efficiency improvements. Scottish Government are providing £14 million of funding for the scheme in 2015/16. In addition, a further phase of the Scottish Government's Green Homes Cashback Scheme was also launched in April 2015. This funding provides vouchers to households to enable them to install energy efficiency measures recommended on a Green Deal Advice Report.

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

Scottish Government; Scottish Local Authorities, Energy Saving Trust Scotland

### **(b) target sectors;**

Domestic

### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

These are provided in Annex B

### **(d) the duration of the obligation period and intermediate periods;**

The scheme is due to run between April 2013 and December 2022. Savings have been presented annually for the period 2014-20.

### **(e) eligible measure categories;**

A range of domestic heating and insulation measures, available through ECO.

**f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The savings presented for this policy are considered deemed savings calculated using the Domestic Energy Model for Scotland (DEMScot). Modelling is based on building stock database abstracted from the Scottish House Condition Survey, building physics parameters and Scottish weather variables. It models total energy use including space and water heating, cooking, lighting and appliances. Model shows the effect that implementing upgrades has on energy use and GHG emissions. We assume a rebound effect of 15% of all energy savings.

**(g) lifetimes of measures;**

Assumptions are the same as those set out for ECO.

Solid Wall Insulation: 36 years

Cavity Wall Insulation: 42 years

Loft Insulation: 42 years

Condensing Boilers: 12 years

**(h) approach taken to address climatic variations within the Member State;**

The scheme only covers Scotland.

**(i) quality standards;**

Work must meet ECO quality standard of PAS2030

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

For the Area Based Schemes, monitoring and verification is carried out by Local Authorities who commission the work.

For the Affordable Warmth Scheme, the eligibility of the individual to receive measures is checked by the Energy Saving Trust under arrangements made by the Scottish Government prior to the referral being made to the energy supplier.

DECC and Ofgem have put in place a comprehensive monitoring and verification process for work carried out using ECO funding, which applies to both the Area Based Schemes and Affordable Warmth Scheme.

For the Energy Assistance Scheme (which does not deliver obligated measures) independent verification of the quality of work is carried out and Key Performance Indicators are used to monitor contract delivery. A similar approach is being adopted for the new HEEPS national scheme.

The Energy Efficiency Loan Scheme will only be available for measures recommended in a Green Deal Advice Report and will require installers to be

registered on the Green Deal Oversight and Registration Body. Applicants will be required to provide evidence that works have been undertaken before loans can be drawn. Sample checks will be carried out.

**(k) audit protocols;**

For the Area Based Schemes, it is a requirement of HEEPS funding that those receiving funding also leverage ECO, Local Authorities, contractors and social landlords will all work in line with DECC and Ofgem's comprehensive audit processes in place for ECO.

Following the distribution of funding auditing is carried out by Local Authorities who procure contractors to deliver the work. Arrangements will vary across Local Authorities but procurement will typically include requirements to ensure that all ECO quality control requirements are met fully. Many local authorities also commission a managing agent who has responsibility for ensuring all relevant ECO protocols are met including quality control.

Audits of particular aspects of the Energy Assistance Scheme are undertaken on an ad-hoc basis.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of Home Energy Efficiency programmes towards the UK Article 7 target is presented in Annex B

## **NORTHERN IRELAND SUSTAINABLE ENERGY PROGRAMME (NISEP)**

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

NISEP is a voluntary scheme set up and overseen by the NI Authority for Utility Regulation (UR). The Energy Saving Trust (EST) acts as Programme Administrator to manage the programme on behalf of UR.

The NISEP works by way of a small sum of money being collected from electricity customers through a Public Service Obligation (PSO) element of use of system charges and is used to provide funding for energy efficiency schemes. A competition to bid for funds to run energy efficiency schemes is carried out on an annual basis. Applications for funding can be made to the Utility Regulator by any organisation that is either licensed by the Utility Regulator or has registered as a Primary Bidder with the NISEP. Applicants to become a Primary Bidder have to meet certain qualifying criteria (which is met by licensed suppliers by virtue of being licensed). Some, but not all, of the licensed energy suppliers in NI participate in the NISEP along with a number of other organisations.

NIE Ltd, the owner of the distribution network in NI, collects the fund and pays it out, to organisations running approved energy saving schemes, in accordance with a condition in its distribution licence.

#### Obligated/Participating/Entrusted parties:

NIE Distribution

All licenced electricity and gas suppliers

Other organisations that have applied to bid for funding.

### **(b) target sectors;**

Domestic & non-domestic buildings, where 80% of the funding is ring-fenced for schemes that target priority (vulnerable/low-income) households. The other 20% of funding is used for schemes that target non-priority domestic households and/or the commercial sector. All energy types are targeted for savings including electricity, gas, oil, coal etc

### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

The estimated energy savings have been set out in Annex B. These are presented as annual savings over the seven year period 2014-20.

### **(d) the duration of the obligation period and intermediate periods;**

It has been agreed (by the Utility Regulator Board) to run the NISEP until March 2016. However, it is possible that it will continue to March 2017 to allow time for an alternative energy efficiency scheme to be introduced in Northern Ireland. The figures presented assume it continues until 2016.

The NISEP runs on an annual basis so individual schemes only last one year or less (if the funding awarded is used up).

**(e) eligible measure categories;**

Insulation – loft, cavity wall, solid wall (internal or external), hot water cylinder and pipe;

Heating systems, including boiler and controls – natural gas or oil (if not on the gas network);

Energy efficient lighting (in domestic sector can be included in a scheme but lighting only schemes are no longer allowed);

Domestic refrigeration and appliances (these measures have not been included in schemes for a number of years);

Other technologies for commercial sector e.g. variable speed drives and compressors, heat exchangers, high bay lighting and liquid refrigerant pumping technology.

This is not an exhaustive list, other measures will be considered if approved by the Energy Savings Trust.

**(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The savings presented for this policy are considered deemed savings based on modelled estimates.

EST use the BREDEM<sup>41</sup> model as the main source of assessing the energy savings from domestic schemes. The model calculates the energy requirements of domestic dwellings and estimates the likely savings resulting from energy efficiency improvements. Primary Bidders are required, as part of the post-implementation reporting of schemes, to fill in a spreadsheet with the number of and types of measures installed in different types of properties. The spreadsheet, compiled by EST, then automatically calculates the energy savings achieved. So that the savings of different fuels can be expressed in a consistent manner, the savings are calculated in 'fuel standardised' terms that reflect the fuel's carbon content. The carbon factors used are consistent (with the exception of electricity which is derived from the generation mix on the island of Ireland) with those published by the Department of Energy and Climate Change (DECC).

The energy savings from commercial installations are generally calculated using the manufacture's specification for the technology but in some cases monitoring of the actual energy savings from the installation is carried out. For smaller SME premises, standard assumptions, similar to those used for sizing domestic properties, are used.

In order to approve schemes submitted by organisations, the Programme Administrator must be satisfied that they provide additionality i.e. they deliver energy

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<sup>41</sup> Housing model build by the Building Research Establishment

savings and that the result will be over and above that which would have been achieved without NISEP funding.

All scheme applications must contain a statement describing how NISEP funding would ensure additionality is achieved.

The following criteria must also be met in regards to additionality:

- Schemes must be additional to any planned activity, regulatory obligation or government-funded initiatives;
- NISEP funding must form a minimum of 20% of the total project costs. In exceptional circumstances a case may be put forward by a Primary Bidder as to why a project should proceed with less than 20% of NISEP funding.
- The Programme Administrator must be satisfied that the Primary Bidder's action will lead to energy saving and that the total improvement is not due to other factors. Therefore, Primary Bidders must not set up any retrospective agreements to provide funding for measures already installed or purchased; and
- Schemes should be designed to target only those customers who are not likely to have gone ahead with installing a measure anyway without any support or encouragement.

Primary Bidders are required to retain evidence of the additionality of schemes and make it available for audit inspection.

**(g) lifetimes of measures;**

Loft Insulation – 30 years;

Cavity Wall Insulation – 40 years;

Internal/External Solid Wall Insulation – 36 years;

Efficient Boiler – 15 years;

Heating Controls – 15 years;

Hot water cylinder and pipe insulation – 10 years;

Energy Efficient Lighting – 10 years (dependent on type of lamp);

Domestic Refrigeration and appliances – various;

Commercial technologies – various.

**(h) approach taken to address climatic variations within the Member State;**

Not applicable

**(i) quality standards;**

British Standards / EST approved measures and technologies.

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

Primary Bidders are responsible for quality assurance and monitoring of installations carried out under their schemes. Where appropriate that will involve independent inspections.

Domestic installations: 100% of heating measures, and more expensive individual measures such as solid wall, must be quality inspected; 10% of individual measures such as insulation or heating controls must be inspected.

Commercial installations: 10% of installations within price range £1,000 to £20,000 must be quality inspected; 50% of installations between £20,001 and £50,000; 100% of installations costing more than £50,000.

EST will also carry out audits on behalf of UR to ensure Primary Bidders are implementing the schemes as required – including the quality assurance requirements.

**(k) audit protocols;**

The Programme Administrator (EST) selects a sample of schemes from each Primary Bidder for Audit. The Audit covers:

Financial Information, procurement, installation of measures, delivery mechanisms, energy savings, additionality and monitoring (customer and quality) processes.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of NISEP towards the UK Article 7 target is presented in Annex B

## **BUILDING REGULATIONS**

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

The responses below cover England, Wales and Northern Ireland. A separate return is provided below of how Building regulations are administered in Scotland.

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

The person carrying out building work to which any requirement of the building regulations applies is responsible for ensuring that the work complies with any such requirement. Details of the building regulations and enforcement can be found at: <https://www.gov.uk/government/policies/providing-effective-building-regulations-so-that-new-and-altered-buildings-are-safe-accessible-and-efficient/supporting-pages/building-control-system>.

The Approved documents and other documents relating to specific requirements of the current Part L (Conservation of Fuel and Power) of the building regulations can be found at: <http://www.planningportal.gov.uk/buildingregulations/approveddocuments/partl/>.

Building Regulations are set and administered by the Department for Communities & Local Government in England and from 2012 by the Welsh Government in Wales (prior to this Buildings Regulations were set and administered on an England and Wales basis).

In Northern Ireland Building Regulations are a devolved matter, and are made and maintained by the NI Department of Finance and Personnel. The regulatory framework is similar to that in England (regulations supported by guidance) having similar target sectors. However, the enforcement of the Northern Ireland building regulations is carried out by District Councils.

### **(b) target sectors;**

New homes, new non-domestic buildings and when building work is carried out to existing properties for which Part L of the building regulations applies including extensions, conversions, renovation of the building envelope and replacement boilers and windows.

### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

The estimated energy savings have been set out in Annex B.

### **(d) the duration of the obligation period and intermediate periods;**

The obligation continues from the date the new regulation is brought in. The above estimates the impact of building work carried out throughout the period 2014-2020. Savings are presented annually for the seven years covered in this report.

Building Regulations are regularly updated and the savings presented in Annex B, represent savings due to Part L changes introduced from 2002, 2005/6 and 2010

following a transitional period. Going forward, it is also a requirement, under Article 4(1) of Directive 2010/31/EU that minimum standards are reviewed at periods of not more than five years.

**(e) eligible measure categories;**

Details of eligible measures are contained in the Approved Documents referenced above. These require new buildings to meet a minimum standard for thermal transmittance for walls, roofs, windows and doors together with efficient heating systems. Existing buildings must meet similar standards when extensions are planned together with standards for replacement heating systems (e.g. the requirement to fit a high efficiency condensing boiler for gas heated homes).

**(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The savings presented for this policy are considered deemed savings.

Calculation of overall building energy performance are undertaken using the UK National Calculation Methodology approved for use in transposition of Article 3 of Directive 2010/31/EU. This considers the range of criteria set out within Annex 1 of that Directive and is applied for new dwellings through the UK Government's Standard Assessment Procedure (SAP) and, for new non-domestic buildings, the Simplified Building Energy Model (SBEM). Calculation of the performance of building elements is demonstrated through reference to the relevant CEN standards.

The estimates of energy savings are based on published impact assessments. These provide details of methodologies and benchmarks.

Impact Assessments<sup>42</sup>

**Part L 2002 (October 2001)**

<http://webarchive.nationalarchives.gov.uk/20120919132719/http://www.communities.gov.uk/documents/planningandbuilding/pdf/154347.pdf>

**Part L 2006**

<http://webarchive.nationalarchives.gov.uk/20120919132719/http://www.communities.gov.uk/publications/planningandbuilding/regulatoryimpactassessment7>

**Part L 2010**

<http://webarchive.nationalarchives.gov.uk/20120919132719/http://www.communities.gov.uk/publications/planningandbuilding/partl2010a>

UK Building Regulations on energy performance have been required since the 1970s. The UK regulations due to Part L 2002, 2006, 2010 all pre-date the 2010 Energy Performance of Buildings Directive (recast) which requires Member States to set requirements for buildings or building units are *set with a view to achieving cost-*

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<sup>42</sup> In some web browsers the URLs to these archived documents may need to be copied into the web browser

*optimal levels*. The UK will count savings from action taken over the period 2014-20 prior to a requirement for all Member States to implement Cost Optimal building regulations.

Part L 2013 revisions have not been included as these post-date the EPBD recast.

Since 1972 it has been policy for the Northern Ireland building regulations to be informed by those regulations in England with the objective of maintaining technical parity.

In relation to the energy requirements of the building regulations, Northern Ireland's Part F requirements (equivalent to Part L in England) is presently in technical harmony with the standards in England; albeit that new uplifted policy standards will come into operation in England in April 2014 and proposed to be reflected in amended N.I. regulations to maintain such parity.

**(g) lifetimes of measures;**

Assumptions were made about the approximate asset life of each of the fabric and building services components. The longest assumed asset life is 60 years. For assets with shorter life (such as lighting and heating and ventilation equipment) the costs of replacement to 2010 standards have been included in order to maintain comparability of costs and benefits over the full 60 year life.

Replacement to the 2010 standard is a requirement of this policy development and it is appropriate that the associated incremental costs and benefits should be included in this IA. The policy is assumed to apply to all building developments over a 10 year period from introduction. The estimated energy savings and incremental costs associated with tightening the Regulations are accumulated and discounted over the 60 year life of each building developed during the policy period.

**(h) approach taken to address climatic variations within the Member State;**

The methodology for calculating the energy performance of buildings approved by the regulations includes climate data. The UK methodology for dwellings (SAP<sup>43</sup>) applies average UK data for heating load assessment and regional factors for solar radiation and cooling loads. The UK methodology for non-domestic buildings (SBEM<sup>44</sup>) does include a number of climate zones across the UK.

**(i) quality standards;**

Details are to be found in the above documents.

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

Building control bodies check that building work has been carried out according to the building regulations. Building control bodies can either be from the local council or the private sector (called 'approved inspectors').

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<sup>43</sup> <http://www.bre.co.uk/sap2009/>

<sup>44</sup> <http://www.ncm.bre.co.uk/>

Details of the building regulations and enforcement can be found at: <https://www.gov.uk/government/policies/providing-effective-building-regulations-so-that-new-and-altered-buildings-are-safe-accessible-and-efficient/supporting-pages/building-control-system>. The documents include details of the functioning of the building control system.

For Wales details may be found at:

<http://wales.gov.uk/topics/planning/buildingregs/control-bodies/?lang=en>

For Northern Ireland details may be found at <http://www.dfpni.gov.uk/index/laws-and-regulations/building-regulations.htm>

### **(k) audit protocols;**

Details can be found at: <https://www.gov.uk/government/policies/providing-effective-building-regulations-so-that-new-and-altered-buildings-are-safe-accessible-and-efficient/supporting-pages/building-control-system>

For Wales details may be found at:

<http://wales.gov.uk/topics/planning/buildingregs/control-bodies/?lang=en>

### **(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of Building Regulations towards the UK Article 7 target is presented in Annex B.

Below is a description of how Building regulations are administered in Scotland.

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

The person carrying out building work to which any requirement of the building regulations applies is responsible for ensuring that the work complies with any such requirement. This responsibility lies ultimately with the building owner. Building regulations are verified (and non-compliance enforced) by local authorities through powers under the Building (Scotland) Act 2003.

Details of the building regulations and enforcement can be found at:

[www.scotland.gov.uk/bsd](http://www.scotland.gov.uk/bsd), with applicable national legislation listed at: <http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/ProceduralLegislation/scottishlegislation>.

The provisions within Scottish building regulations specific to the carbon and energy performance, which are applicable to new buildings and where building work is undertaken to existing buildings are set out within section 6 (energy) of the Technical Handbooks<sup>45</sup>. These Handbooks provide guidance on achieving the standards set in the Building (Scotland) Regulations 2004 and are available in two volumes, for Domestic buildings<sup>46</sup> and for Non-domestic buildings<sup>47</sup>.

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<sup>45</sup> <http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/techbooks/techhandbooks>

<sup>46</sup> <http://www.scotland.gov.uk/resource/buildingstandards/2013Domestic/chunks/ch07.html>

Building Regulations in Scotland are set and administered, on behalf of Scottish Ministers, by the Building Standards Division of the Scottish Government.

**(b) target sectors;**

New buildings (dwellings and non-domestic buildings); work to convert, extend or alter existing buildings; work to replace elements of existing buildings. Exceptions where building regulations do not apply are listed in schedule 1 to regulation 3 of the Building (Scotland) Regulations 2004<sup>48</sup>, as amended by The Building (Scotland) Amendment Regulations 2009<sup>49</sup>. These exceptions are explained, in context, within Section 0 of the Technical Handbooks.

**(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

The estimated energy savings have been set out in Annex B.

Historically, energy efficiency requirements in Scottish building regulations have been driven by domestic energy and climate change policy which predates the introduction of the requirements under EU Directives. As of 9 January 2013, it is a requirement under Article 4 of Directive 2010/31/EU that Member States set minimum energy performance requirements for buildings or building units with a view to achieving cost-optimal levels of performance. Article 9 of the same Directive requires that all new buildings are 'nearly zero energy' from 30 December 2018 for new buildings occupied by public authorities and from 30 December 2020 for all other new buildings. All the financial, energy and carbon savings in this analysis, due to improvements in standards introduced in 2002, 2007, 2010 and proposed for 2015 are therefore qualified as that which is additional over the requirements of that Directive.

**(d) the duration of the obligation period and intermediate periods;**

Savings have been presented annually for the period 2014-20. Performance requirements set by building regulations apply from the date the new regulation is brought into force. Where work is undertaken to meet a prescribed level of performance, that level of performance must not be adversely affected by future building work by the persons responsible for the building. Estimated savings consider the impact of regulation on building work carried out throughout the period 2014 to 2020. Savings delivered are cumulative, recurring each year, and represent the energy saved compared to equivalent performance in the absence of regulations made between 2002 and 2010.

Energy standards within building regulations are subject to review with improvements introduced in 2002, 2007, 2010 and further improvements announced for October 2015. It is also a requirement, under Article 4(1) of Directive 2010/31/EU that minimum standards are reviewed at periods of not more than five years.

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<sup>47</sup> <http://www.scotland.gov.uk/resource/buildingstandards/2013NonDomestic/chunks/ch07.html>

<sup>48</sup> <http://www.legislation.gov.uk/ssi/2004/406/contents/made>

<sup>49</sup> <http://www.legislation.gov.uk/ssi/2009/119/regulation/2/made>

**(e) eligible measure categories;**

Other than where exempted under schedule 1 to regulation 3 of the Building (Scotland) Regulations 2004, minimum standards are sought for overall energy performance in new buildings (standard 6.1) and for all elements of building fabric (building envelope – standard 6.2) or fixed building services (technical building systems – standards 6.3 to 6.7 and 6.10). Details of these provisions are identified within section 6 (energy) of the Domestic and Non-Domestic Technical Handbooks published by the Scottish Government – see <http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/techbooks/techhandbooks> .

**(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The savings presented for this policy are considered deemed savings.

Calculation of overall building energy performance are undertaken using the UK National Calculation Methodology approved for use in transposition of Article 3 of Directive 2010/31/EU. This considers the range of criteria set out within Annex 1 of that Directive and is applied for new dwellings through the UK Government's Standard Assessment Procedure (SAP) and, for new non-domestic buildings, the Simplified Building Energy Model (SBEM).

Considerations of additionality are as set out for England, Wales and Northern Ireland.

Calculation of the performance of building elements is demonstrated through reference to the relevant CEN standard, via conventions cited in guidance on compliance with building regulations – for example BR443 - 'conventions for U-value calculations'<sup>50</sup>.

The estimates of energy savings derived from application of building regulations are based on implementation of the following improvements in building regulations. As these follow a similar review timetable and level of ambition as other UK administrations, it is considered appropriate to assign an overall level of reduction in energy demand as an additional percentage over and above that calculated elsewhere in the UK, based upon development in Scotland accounting for approximately 8% of the UK total. Links are provided to the relevant impact assessments for further information on methodologies and benchmarks.

**Part J (2002)** - <http://www.scotland.gov.uk/Resource/Doc/980/0003254.pdf>

**Section 6 (2007)** - <http://www.scotland.gov.uk/Resource/Doc/917/0049778.pdf>

**Section 6 (2010)** - <http://www.scotland.gov.uk/Resource/Doc/917/0098823.pdf>

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<sup>50</sup> [http://www.bre.co.uk/filelibrary/pdf/rpts/BR\\_443\\_\(2006\\_Edition\).pdf](http://www.bre.co.uk/filelibrary/pdf/rpts/BR_443_(2006_Edition).pdf)

**(g) lifetimes of measures;**

Estimates of the lifetime of measures vary according to the element concerned. Current impact assessment is based upon an assumption of a 60 year life for new dwellings and a 30 year life for new non-domestic buildings and a range of product lifespans for various individual building components.

**(h) approach taken to address climatic variations within the Member State;**

In setting performance requirements, variation based upon local or regional climate is not considered in Scotland, with requirements for new buildings using the same climate data set for any location across Scotland. The UK methodology for dwellings SAP<sup>51</sup> applies one set of climate data (temperature, degree day) for assessment of new dwellings but considers regional factors such as insolation (solar radiation). The UK methodology for non-domestic buildings SBEM<sup>52</sup> does include a number of climate zones across the UK but only one for Scotland.

**(i) quality standards;**

Per note in item (e), details are to be found in guidance documents published in support of Scottish building regulations.

Minimum standards are sought for overall energy performance in new buildings (standard 6.1) and for all elements of building fabric (building envelope – standard 6.2) or fixed building services (technical building systems – standards 6.3 to 6.7 and 6.10). Details of these provisions are identified within section 6 (energy) of the Domestic and Non-Domestic Technical Handbooks published by the Scottish Government.

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

Per note in item (a), Building regulations are verified (and non-compliance enforced) by local authorities through powers under the Building (Scotland) Act 2003. Details of the building regulations and enforcement can be found at: [www.scotland.gov.uk/bsd](http://www.scotland.gov.uk/bsd), with applicable national legislation listed at: <http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/ProceduralLegislation/scottishlegislation>. See also response to item (k).

**(k) audit protocols;**

Information on the performance framework put in place to support delivery of the building standards systems and enforcement by local authorities can be found online at: <http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/verification/2011-17>.

The Scottish Government Building Standards Division has been appointed to monitor Local Authorities as Verifiers. Verifiers will be subject to regular monitoring and periodic inspection under a performance framework introduced in May 2012 and measureable from 1 October 2012. It seeks to address a wide range of actions and

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<sup>51</sup> <http://www.bre.co.uk/sap2009/>

<sup>52</sup> <http://www.ncm.bre.co.uk/>

behaviours which, between them, demonstrate a strong customer-focused service. It will allow the assessment of building standards performance outcomes over a range of key national objectives. It has been developed to improve the quality, compliance, consistency and predictability of verification activities carried out by Scottish local authorities. The framework consists of nine key performance outcomes (KPO) in three broad perspectives:

Professional Expertise & Technical Processes

Quality Customer Experience

Operational & Financial Efficiency

Two additional cross-cutting themes of Public Interest and Continuous Improvement span all three perspectives in relation to building standards verification strategy, operational delivery and internal and external relationships.

**(I) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of Building Regulations towards the UK Article 7 target is presented in Annex B.

## **CLIMATE CHANGE LEVY (CCL)**

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive that are applicable to taxation policies.

### **(a) target sectors;**

The Climate Change Levy is charged on electricity and other energy products used by business consumers including consumers in, industry, commerce, agriculture, public administration, and other services. The main rates of CCL do not apply to taxable commodities supplied for use by domestic consumers or to charities for non-business use, while use in metallurgical and mineralogical processes, non-fuel and dual use applications, transport and the production of electricity and energy products is exempt.

### **(b) implementing public authorities;**

The scheme is run by HM Revenue & Customs with payments collected by energy providers.

### **(c) the expected savings to be achieved;**

The estimated energy savings from the Climate Change Levy over the period 2014-2020 have been set out in Annex B. These are presented as annual savings over the seven year period.

The savings presented are based on the impact of the duty charged that is additional to the EU Energy Taxation Directive (ETD) minimum rates for CCL taxable commodities.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:283:0051:0070:EN:PDF>

### **(d) the duration of the taxation measure and intermediate periods;**

The Climate Change Levy was introduced in 2001. There is no planned end date so is assumed to continue for the whole period 2014-2020. The CCL rate is set each year by HMRC.

### **(e) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

Savings from this policy are calculated using the method set out in Annex V(3) as relevant to taxation policies.

The calculation of energy savings has been made based on long-run price elasticities applicable to the sectors within the UK from published academic literature.

Organisations within a range of sectors can claim partial exemption from the CCL if they have a Climate Change Agreement (CCA)).

For participants within the Climate Change Agreement, their CCL rate is reduced to approximately the ETD minimum rate. Savings within the CCA sector are presented separately.

Given the CCL is an existing policy measure the analysis estimates what increase in energy consumption would be observed if the CCL was not charged above the ETD minimum.

**Energy** – Only energy consumed by organisations without a CCA and therefore paying the full rate of CCL has been included in the calculation. The energy consumed in 2010 has been estimated based on the total amount of tax collected less the energy consumption covered by the CCA. Future energy consumption in the scenario with the CCL has been taken from the projected trend in the industrial sector taken from DECC’s Energy & Emissions Projections, September 2014 (Annex F)<sup>53</sup>

**Prices** – DECC publishes projections of retail energy prices based on the market outlook for energy and assumptions about the generation mix of electricity. (Annex M of the Energy & Emissions Projections)

The elasticity is applied based on the difference between the projected retail price with the CCL and the retail price excluding the CCL rate charged above the EU minimum. The UK CCL rate is assumed to increase with the UK Retail Prices Index (RPI). The current CCL rates are published by HM Revenue & Customs<sup>54</sup>. The rates from April 2015 are summarised below:

<b>Taxable commodity supplied</b>	<b>Unit</b>	<b>Rate</b>	<b>Reduction on main commodity rate for holders of a CCA</b>
Electricity	per kWh	£0.00541	10%
Gas	per kWh	£0.00188	35%
LPG and other gaseous hydrocarbons in a liquid state	per kilogram* (use a conversion rate of 2,000 litres per tonne litres of butane and propane to kilograms)	£0.01210	35%
Any other taxable commodity	per kilogram	£0.01476	35%

**Elasticity** – In 2012 DECC commissioned Professor Paul Ekins of University College London to review academic literature of price elasticities. Table 1 below summarises the academic analysis of price elasticities. This showed that there is a high range of possible elasticities within the Industrial sector. This analysis is based on the median estimate by Agnolucci (2010) of 0.47 using a structural time series model with asymmetric prices and includes recent years in the analysis.

<sup>53</sup> <https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2014>

<sup>54</sup> <https://www.gov.uk/climate-change-levy-application-rates-and-exemptions#main-rates>

**Table 1 Price Elasticities for Energy Demand<sup>55</sup>.**

Study	Sample	Estimated Elasticities	Methodology
<b>Agnolucci (2010)</b>	<b>1973-2005</b>	-0.65/-0.47/-0.37 (all lr)	<b>Quarterly Data - Structural Time Series Model with Asymmetric Prices</b>
Agnolucci (2010)	1973-2005	-0.43 (sr) / -0.59 (lr)	Quarterly Data. Structural Time Series Model
Agnolucci (2009a)	1978-2004	-0.64	Average from several panel estimators
Agnolucci (2009b)	1978-2004	-1.05 to -0.43	Static Translog model
Beenstock and Dalziel (1986)	1953-1982	-0.29	3SLS
Dimitropoulos et al (2006)	1967-1999	-0.16	Structural Time Series Model
Hunt (1986)	1960-1980	-0.28	Translog Model
Hunt et al (2003) *	1971-1997	-0.20	Quarterly Data - Structural Time Series Model
Lynk (1989) *	1949-1981	-0.23 (sr) / -0.69 (lr)	Translog model allowing for Capital adjustments

\*Manufacturing sector only

<sup>55</sup> Energy Price Elasticities: A critical survey for DECC (Paul Ekins 2012) – un-published

## CLIMATE CHANGE AGREEMENTS (CCA)

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

### Summary

Climate Change Agreements (CCAs) are part of a package of government measures aimed at encouraging UK business to save energy and reduce carbon dioxide emissions. They set the terms under which eligible energy-intensive industries can claim a discount on the Climate Change Levy (CCL), provided they set and meet an overall sector target for improving their energy efficiency or reducing their carbon emissions.

There are 51 umbrella CCAs with trade bodies representing energy-intensive business sectors. These umbrella agreements are public documents containing:

- lists of facilities eligible for the CCL discount
- sector targets
- conditions that apply to participating companies

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

Participation in the Scheme is on a voluntary basis. Once entered into, the conditions of a CCA are binding in order to claim the discount on the CCL. The scheme is administered by the Government's Environment Agency.

### **(b) target sectors;**

Industrial energy-intensive sectors.

### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

The estimated energy savings have been set out in Annex B - see paragraph (f).

### **(d) the duration of the obligation period and intermediate periods;**

CCAs will be in place up to March 2023 with a review of the current targets taking place in 2016. Savings for the period 2014-2020 are included in the analysis. These are presented as annual savings over the seven year period 2014-2020.

### **(e) eligible measure categories;**

CCAs are intended to incentivise energy efficiency which results in a wide range of measures being implemented across 51 broad industrial activities.

### **(f) calculation methodology<sup>56</sup>, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

Savings from this policy are considered deemed savings. They have currently been estimated using the method set out in Annex V(3) as relevant to taxation policies.

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<sup>56</sup> This methodology will be reviewed as part of the CCA evaluation work that will take place ahead of the announced review of the Scheme's targets in 2016.

The stated objective of the CCA target regime is to achieve at least the level of energy savings that would have occurred if CCA sectors were subject to the full CCL. However, in practice, targets have been set to reflect what has been agreed with sectors as being realistic, taking account of factors such as payback periods and broad price trends. Furthermore, companies have the option of paying a buy-out to remain compliant with the scheme if they fail to meet their targets. It is also a premise of the scheme that application of full CCL would have adverse competitiveness impacts, potentially leading to closure of firms. This would affect any counterfactual using full CCL as its basis. It has therefore not been possible to provide a reliable estimate of the additional energy that CCAs will save. However, to provide an illustrative estimate the following approach has been adopted: *In the absence of CCAs, consumers would be required to pay the full rate of the CCL on their energy consumption and therefore the initial estimate of savings assumes the same level of energy savings as if these consumers paid the full CCL. These savings have been calculated using a price elasticity of demand relative to the Energy Taxation Directive (ETD) as described in the CCL notification of methodology above.* The scheme coverage has been adjusted to account for the exit of the metallurgical and mineralogical processes from the CCA, following the introduction of an exemption from the Climate Change Levy (CCL) for energy used for these processes.

**(g) lifetimes of measures;**

It is not possible to give an estimate of the average lifetime of these measures as conditions may vary between technologies and sectors.

**(h) approach taken to address climatic variations within the Member State;**

These are not deemed significant in the non-domestic sector

**(i) quality standards;**

Setting energy efficiency targets follows a systematic approach to assess existing evidence on abatement potential. This process identifies energy savings by specific technologies, current uptake of measures and barriers to implementation. The target process also follows an audit and reconciliation process by which all sectors' performance is checked against the agreed targets. Performance results are published in milestone reviews every two years.

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

The scheme is currently monitored and verified every two years in milestone reviews by the Environment Agency. CCA participants must report specified data at the end of each milestone period, including energy use for their target unit or total number of units of carbon emitted by their target unit.

As part of the monitoring and verification protocols, the Environment Agency may issue financial penalties to an operator that:

- fails to report by 1 May following the end of the target period;

- fails to provide any further information the Environment Agency has requested by the deadline set;
- provides inaccurate information;
- doesn't tell them about any changes to their operations that would affect its CCA

**(k) audit protocols;**

The Environment Agency carries out audits on selected target unit operators and sector associations through the lifetime of the scheme to verify eligibility and performance. This follows a mixed risk based and random selection approach.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of CCAs towards the UK Article 7 target is presented in Annex B.

## **CRC ENERGY EFFICIENCY SCHEME**

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

### **Summary**

The CRC Energy Efficiency Scheme (CRC) is a mandatory scheme aimed at improving energy efficiency and cutting emissions in large users of energy in the public and private sectors. These organisations are responsible for around 10% of the UK's greenhouse gas emissions.

The scheme features a range of drivers which aim to encourage organisations to develop energy management strategies that promote a better understanding of energy usage. It is designed to target energy supplies not already covered by Climate Change Agreements (CCAs) and the EU Emissions Trading System.

#### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

Organisations within the UK will qualify for the CRC if they have:

- at least one settled half hourly electricity meter
- consumed at least 6,000 megawatt hours (MWh) or more of qualifying electricity supplied on the settled half hourly market

#### **(b) target sectors;**

Non-domestic large energy users

#### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

Estimates of the expected energy savings are provided in Annex B

#### **(d) the duration of the obligation period and intermediate periods;**

The CRC Order sets the period of the scheme from 2010 to 2047. Savings for the period 2014-2020 are included in the analysis. These are presented as annual savings over the seven year period 2014-2020.

#### **(e) eligible measure categories;**

The CRC incentivises a range of measures. The modelling distinguished between behavioural and technical measures. Behavioural measures may not have a capital cost associated with them but require a change in use of energy consuming products to generate savings. Technical measures in contrast require a piece of equipment to be implemented to generate energy savings and have a capital cost.

**(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The savings presented for this policy are considered deemed savings based on assumptions of the action taken by consumers as a result of the scheme.

The analysis on the impact of CRC on energy savings is based on modelling take up rates<sup>57</sup> of energy efficiency potential in response to carbon prices. It assumes that CRC organisations will take up measures that equate to a cost of up to £16 per tCO<sub>2</sub> (current cost of CRC allowances). Then it deducts the impact of other policies that would have overlapped with the CRC. The scheme coverage has been adjusted to account for the exclusion of metallurgical and mineralogical processes from the CRC, following the introduction of an exemption from the Climate Change Levy (CCL) for energy used for these processes<sup>58</sup>. The potential measures are drawn from two databases of technological and behavioural measures: Building Research Establishments (BRE's) abatement cost curves for non-domestic sector buildings<sup>59</sup> and the ENUSIM<sup>60</sup> model for industrial sectors' activities. These comprise detailed bottom-up engineering models of technological abatement opportunities in each sector.

Finally, energy savings have been adjusted to remove the impact of savings incentivised by these policies prior to 2014. This is done by removing legacy savings of technologies that the abatement potential analysis suggests will be adopted up to 2013.

DECC plans are to continue claiming CRC savings on this basis until the Scheme has been evaluated. This evaluation will report in 2015 ahead of a full review of the Scheme in 2016.

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<sup>57</sup> Energy Efficiency and Trading Part II: Options for the Implementation of a New Mandatory UK Emissions Trading Scheme. Department for the Environment, Food and Rural Affairs. 28 April 2006.

<sup>58</sup> The impacts of this change have been presented in the February 2014 Impact Assessment "Finalising CRC simplification: treatment of renewable energy & the metallurgical and mineralogical sectors", [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/289117/Amendment\\_Order\\_-\\_Final\\_Impact\\_Assessment\\_05-03-2014.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/289117/Amendment_Order_-_Final_Impact_Assessment_05-03-2014.pdf)

<sup>59</sup> NDEEM was developed by the Building Research Establishment to provide an insight into energy use and abatement potential within the country's non-domestic properties. Christine Pout: "N-DEEM: The national non-domestic building energy and emissions model – an overview", Environment and Planning B: Planning and Design 2000, volume 27, pages 721-732

<sup>60</sup> ENUSIM (2002), End-Use Simulation Model, Defra.

**(g) lifetimes of measures;**

The weighted average of the lifetime of cost effective measures suggests that technical measures will be replaced (or reintroduced) every nine years.

These measures would cover a large variety of measures in the following groups

- Equipment efficiency (such as more efficient boilers, pumps and motors);
- Automatic controls (such as stairwell timers and presence detectors);
- Behavioural controls (such as energy management systems);and
- Building fabric (such as cavity wall insulation).

**(h) approach taken to address climatic variations within the Member State;**

These are not deemed significant in the non-domestic sector.

**(i) quality standards;**

A wide range of measures could be installed as a result of the CRC scheme. The original analysis<sup>61</sup> identified more than two hundred measures. These measures are not reported but CRC energy consumption and emissions are reported annually and data is published by the Environment Agency. The scheme is administered and enforced as set out in (j).

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

The CRC is fully monitored by the Environment Agency (EA), a non-departmental public body. The Agency ensures compliance amongst participants with a programme of audits based on risk assessment with additional financial penalties levied on those found not to have complied.

**(k) audit protocols;**

The EA audits participants to ensure they have accurately reported their emissions.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of CRC Energy Efficiency Scheme towards the UK Article 7 target is presented in Annex B.

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<sup>61</sup> Energy Efficiency and Trading Part II: Options for the Implementation of a New Mandatory UK Emissions Trading Scheme. Department for the Environment, Food and Rural Affairs. 28 April 2006.

## **SMART METERING (Non-domestic)**

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

### **(a) obligated, participating or entrusted parties, or implementing public authorities:**

Energy suppliers will be responsible for the provision and installation of smart meters in non-domestic premises and are required under conditions in their licences to take all reasonable steps to complete the roll-out by the end of 2020.

### **(b) target sectors:**

Smaller and medium-sized non-domestic premises in Great Britain. This captures users with electricity meters in profile classes 3 and 4 (typically smaller non-domestic users).

### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods:**

Savings for each year between 2014 and 2020 have been presented in Annex B.

### **(d) the duration of the obligation period and intermediate periods:**

Energy suppliers will be responsible for the provision and installation of smart meters in non-domestic premises and are required under conditions in their licences to take all reasonable steps to complete the roll-out by the end of 2020.

There are two periods of non-domestic smart meter roll out. The Foundation stage during which energy suppliers will trial and test their systems to build market and business readiness for the period where smart meters will be deployed at volume pursuant to their 2020 obligations.

### **(e) eligible measure categories:**

Generally smart metering equipment must comply with the Smart Meter Equipment Technical Specification (SMETS)<sup>62</sup> extant at the time of installation to ensure common minimum functionality and support interoperability. For the non-domestic sector the deployment of meters with some but not all the smart functionality in SMETS is also permissible in certain circumstances.

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<sup>62</sup> <https://www.gov.uk/government/consultations/smart-metering-equipment-technical-specifications-second-version>

**(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The savings presented for this policy are considered deemed savings.

Basis for estimates / materiality of energy savings:

The calculation methodology used here is consistent with the approach set out in the January 2014 Smart Meter Impact Assessment<sup>63</sup>. Energy savings from installations prior to 2014 have been excluded in this notification.

In the non-domestic sector, we assume that smart/advanced meters, together with provision of data, reduce energy consumption by 2.8% (electricity) and 4.5% (gas) per meter in central scenarios. The primary source of evidence for this is a trial of advanced metering in 538 SME sites carried out by the Carbon Trust in 2007<sup>64</sup>.

Additionality

The Government's policy design and implementation work has progressed through various stages. The initial policy design phase concluded in March 2011 with the publication of the Government's Response to the Smart Meter Prospectus confirming the approach chosen for the delivery of smart meters. Key features of the roll-out include:

- Energy suppliers will be responsible for the provision and installation of non-domestic smart meters and are required under conditions in their licences to take all reasonable steps to complete the roll-out;
- Metering equipment must comply with Smart Meter Equipment Technical Specifications (SMETS) to ensure common minimum functionality and support interoperability (some exceptions apply for the non-domestic sector);
- A central Data and Communications Company (DCC) will provide the communications platform for the secure transmission of smart meter data and messages (for non-domestic suppliers use of the DCC will be voluntary);
- The DCC will be a licenced body regulated by Ofgem, the energy industry regulator.

The energy savings included in this return are based on the latest published Impact Assessment. In the non-domestic sector, the Impact Assessment assumes that without Government intervention market participants will only install smart/advanced meters where a positive business case exists for one or more parties. We assume that this would be 50% of the market by 2030.

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<sup>63</sup> <https://www.gov.uk/government/publications/smart-meter-roll-out-for-the-domestic-and-small-and-medium-non-domestic-sectors-gb-impact-assessment>

<sup>64</sup> <http://www.carbontrust.com/resources/reports/technology/advanced-metering-for-smes>

**(g) lifetimes of measures:**

Energy suppliers will be responsible for the provision and installation of smart meters in non-domestic premises and are required under conditions in their licences to take all reasonable steps to complete the roll-out by the end of 2020. A non-domestic smart meter is expected to last 15 years.

**(h) approach taken to address climatic variations within the Member State:**

No climatic variations are considered in the analysis.

**(i) quality standards:**

The Smart Meter Equipment Technical Specification (SMETS) is described in section (e).

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured:**

Energy suppliers are required by licence conditions to submit plans and report the progress of their non-domestic smart meter roll out to Ofgem, the UK's wholly independent energy regulator.

**(k) audit protocols:**

Ofgem have statutory powers to enforce compliance against supplier plans for roll out of smart meters in non-domestic premises.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account:**

The contribution of non-domestic Smart Metering towards the UK Article 7 target is presented in Annex B.

## **ENERGY SAVING OPPORTUNITY SCHEME (ESOS)**

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

Obligated – non-SME enterprises, as defined by article 2(26) of the Energy Efficiency Directive, specifically: enterprises that employ fewer than 250 persons and which satisfy one or both of the following criteria: (i) an annual turnover that does not exceed €50 million, and/or (ii) an annual balance sheet total that does not exceed €43 million.

Participating/entrusted parties – the UK Environment Agency is responsible for administering the scheme, and the Environment Agency and regional agencies are responsible for enforcing and auditing compliance with the scheme. Energy audits will be carried out by the private sector.

Implementing public authorities – the Environment Agency and regional agencies (see above).

### **(b) target sectors;**

Target sector is the non-domestic sector (non-SMEs enterprises, as defined above)

### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

The estimated energy savings from ESOS have been set out in Annex B. These are presented as annual savings over the seven year period 2014-20.

### **(d) the duration of the obligation period and intermediate periods;**

ESOS is a regulation that does not have an end date. i.e. it will remain active until such time that it is repealed through legislation.

Intermediate obligation periods for conducting ESOS assessments will be: December 2015 and December 2019.

We will continue monitoring ESOS and the EU requirements to determine the future of the scheme.

### **(e) eligible measure categories;**

Energy audits carried out for/by non-SMEs in scope of the scheme will result in recommendations being made to those organisations of measures that could be taken in order to make energy savings. The nature of the recommended measures will depend on the nature of the audited organisation's energy use.

**(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The following steps were taken to arrive at the above estimate of energy savings. The methodology corresponds to that described in bullet point (a), paragraph 1 of Annex V of the Directive, i.e. an ex-ante estimate of energy savings.

In buildings and industrial processes, ESOS assessments are assumed to lead to:

- no reduction in use energy covered by CCAs or used by the fuel industry
- 1% reduction in demand for energy covered by another policy instrument
- 2% reduction in demand for energy not covered by existing policy

In transport sector and fleets, ESOS assessments are assumed to:

- Have no impact on energy consumption by rail, aviation, shipping or business travel in household-owned cars,
- Lead to 1% reduction in energy consumption by vans, heavy good vehicles and buses & coaches,
- Lead to 2% reduction in energy consumption for business travel in company car fleets.

The detailed methodology is as set out in the impact assessment published at:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/323116/ESOS\\_Impact\\_Assessment\\_FINAL.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/323116/ESOS_Impact_Assessment_FINAL.pdf)

**(g) lifetimes of measures;**

Organisations in scope of ESOS will not be legally obligated to implement energy efficiency measures recommended through an ESOS assessment. Therefore we cannot anticipate the lifetime of energy efficiency measures implemented, though it would be reasonable to assume measures implemented will be permanent rather than temporary.

**(h) approach taken to address climatic variations within the Member State;**

These are not deemed significant in the non-domestic sector.

**(i) quality standards;**

Responsibility for monitoring and enforcing ESOS lies with independent public bodies: the Environment Agency in England, the Scottish Environment Protection Agency, Natural Resources Wales and, in Northern Ireland, the Northern Ireland Environment Agency. This will ensure ESOS achieves maximum impact.

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

Responsibility for monitoring and enforcing ESOS will lie with independent public bodies: the Environment Agency in England, the Scottish Environment Protection Agency, Natural Resources Wales and, in Northern Ireland, the Northern Ireland Environment Agency.

**(k) audit protocols; and**

The Government will evaluate the impact of ESOS in 2016. The evaluation will include an assessment of the extent to which ESOS has led to enterprises implementing energy efficiency measures and the effectiveness of the enforcement regime.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of ESOS towards the UK Article 7 target is presented in Annex B

## **SALIX PUBLIC SECTOR ENERGY EFFICIENCY LOAN SCHEME**

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

The Salix Finance energy efficiency loan scheme is funded by DECC, and the Welsh and Scottish Governments and provides interest-free loans to Public Sector bodies to fund energy efficiency improvement projects. The energy savings made enable the Public Sector body to repay the loan to Salix over an agreed repayment period. The majority of repayments are then allocated to further energy-efficiency projects by agreeing further loans.

### **(b) target sectors;**

All public sector buildings in England, Scotland and Wales, with the exception of social housing. Local Authority Housing is funded using the Housing Revenue Account which is subject to separate accounting procedures.

### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

These are provided in Annex B. These are presented as annual savings over the seven year period 2014-20.

The savings were calculated based on annual funding averaging £60m and average annual kWh saving of 4.5kWh per £1 invested. See section (f) for further details.

### **(d) the duration of the obligation period and intermediate periods**

The majority of repayments made for existing loans committed during previous rounds of funding are used for further rounds of energy-efficiency loans. As such, a significant portion of the Salix funding are confirmed throughout the obligation period (i.e. 2014-2020).

In addition to this, Salix may receive new capital loan funding from DECC, and possibly other government departments (e.g. Department for Education). The savings have not assumed that this additional funding is made available. Confirmed additional funding from DECC amounts to £80m over the period 2014/15 to 2017/18. The reinvestment of this additional funding as projects are repaid to Salix has also been built into the analysis.

**(e) eligible measure categories;**

Salix Finance supports a broad range of energy-efficiency technologies, which all have lifetime energy saving estimates based on an established methodology, the basis of which is explained in more detail in section (f). Examples of commonly funded energy-efficiency technologies include:

Energy efficient lighting, such as LED and T5 lamps

Installation and upgrading of building energy management systems

Energy efficient street lighting, such as part night dimming systems and LED replacements

Improvements to heating systems, such as implementing heat recovery and switching from oil to gas boilers

Building fabric insulation improvements, such a cavity wall and loft insulation

Installation of combined heat and power (CHP) units

**(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The energy savings presented for this policy are considered deemed savings and are based on the performance of previous Salix energy efficiency projects with the following assumptions:

The forecast number of Salix projects is determined by the level of funding. While some elements are confirmed due to the recycling of funding from loan repayments, there is no guarantee that the scheme will receive new funding in any year. Figures calculated in section (c) are based on existing Recycling Fund and SEELS England programmes, confirmed additional funding and the recycling of both of these. Figures based on actual annual estimated total funding have been used in the calculation, the average annual total being £60m.

An average annual energy saving of 4.5 kWh per £1 invested is assumed, and this is based on projects committed from 2011 to 2013. There are a number of factors which can affect this, primarily the mix of projects which reduce heating consumption (predominantly gas) or electricity use. For the purposes of this exercise, we have assumed that new projects will remain broadly similar to those that have been funded in the previous three years (i.e. predominantly electricity savings). It is worth noting that Salix has funded a number of projects, largely CHP, which give carbon and financial savings through a reduction in electricity consumption, but result in a net increase in kWh consumption, due to the increase in gas usage. These projects are factored into the average.

In this analysis it has been assumed that one third of the energy savings are additional to existing measures, i.e. two thirds would have been realised without Salix. This assumption is based on analysis of an interest free loans scheme for small and medium sized enterprises.

We only count savings from projects from their first full year of operation (i.e. we would not count savings from a project completed in mid-2014 until 2015, when it would make its first full year of savings). As such, funding for 2020 has not been included as under these assumptions, savings would not be counted until 2021.

The average lifetime for projects funded by Salix Finance in the last three years is 14 years. As such, a safe assumption has been made that projects committed in the reporting period will continue to save for at least the period from completion through to 31st December 2020.

Each of the assumptions above have been made to ensure that the method for calculating these savings estimates is transparent and robust.

**(g) lifetimes of measures;**

A persistence factor is determined from the useful life of the equipment or behavioural measure multiplied by two percentage degradation factors: (1) the inherent degradation of the equipment (i.e. the inherent reduction of performance through time due to wear and tear etc.) and; (2) the operational degradation which reflects maintenance policy.

A persistence factor is in place for each of the energy-efficiency technologies supported by Salix. This is based on a recognised and well-established methodology developed by a working group of which Salix was a part.

Where a public sector body identifies that a project will be installed on a site with an estimated lifespan which is lower than the technology lifespan, the site life will be used in the lifetime savings calculations.

A distribution of persistence factors has been calculated based on the persistence factors for different types of energy efficiency projects. The distribution has been calculated by using the modal, maximum and minimum persistence factors (12 years, 30 years and 3 years respectively). This means that the energy savings from an energy efficiency project are assumed to reduce with time. Energy savings are assumed to reduce from 100% in years 1, 2, 3 and 4 to 98% in year 5 and 96% in year 6.

**(h) approach taken to address climatic variations within the Member State;**

The impact of climatic variation, such as varying hours of darkness or heating degree-days, may have on the savings estimated for projects will differ dependent on the type and location of the project being undertaken. As public sector bodies are aware of the specific climatic variations for their region and how these impact projects, this impact will form part of their estimation of savings prior to submission to Salix.

**(i) quality standards;**

Quality standards include, but are not limited to:

The Salix compliance tool – completion of the tool is a requirement for all loan applications, and ensures all project details such as cost, estimated savings and technology are captured. The tool also calculates the estimated carbon savings using our annual updated carbon conversion factor, as well as payback and cost per tonne of carbon saved over the lifetime of the project. It also captures the proportion of total cost provided by Salix, and any additional funding from other sources being used to enable the project.

Business case template – required for all projects valued over £100,000. This allows a formal, standardised business case assessment to be undertaken by our contracted external technical experts.

Application form – required for all new loan applications and ensures appropriate authorisation within the public sector body making the application.

Timescales – applications are assessed within 10 working days with applicant Public Sector body being advised on the outcome as soon as the assessment is completed

Technical assessment process – all applications are subject to the same technical assessment procedures. Checks made include a comparison of variables such as payback with a knowledgebase consisting of previously funded projects. This allows Salix to check for any which fall out of normal limits. Additional checks include manual review of supporting information such as calculations and technical literature for the proposed energy-efficiency technology.

Standardised process for committing and payment of funding – upon completing the assessment stages and being approved for funding, a process is then followed for committing of funding, notification of completion, payment of loan and then agreed, fixed repayments of the loan by Direct Debit.

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

The assessment methodology undertaken by Salix does not in itself directly confirm that the reported savings will be achieved. It is a framework in order to try to ensure that everything possible is done to complete the projects and realise the associated energy savings. The methodology includes procedures for detecting those projects with unusual costs or forecast savings so that Salix can check that the approach taken by the Public Sector bodies is appropriate for estimating the likely savings. Business cases for larger projects include details of monitoring and verification plans to be put in place on completion of projects. Post-project audits on specific funded projects are undertaken as part of the limited assurance audit and this will include confirming that the savings have been achieved.

Regular meetings and discussions take place between Salix and its borrowers where they are able to give updates on results from their projects post-completion.

**(k) audit protocols;**

Salix has engaged KPMG LLP (UK) (Chartered Accountants) to provide assurance over the application of the procedures and processes which Salix operates in order to ensure the consistency of approach, reliability and appropriateness of the estimates of carbon savings generated by clients for the projects which they undertake. As part of this audit, projects committed in the previous financial year are selected at random so that they can be tested and the client interviewed to ensure all required processes have been followed.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of Salix towards the UK Article 7 target is presented in Annex B

## **GREENING GOVERNMENT COMMITMENT (GGC)**

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive.

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

The Greening Government Commitments (GGCs) are targets for reducing the environmental impact, including greenhouse gases, of the central government estate and operations in the United Kingdom.

Similar schemes are in operation in Wales and Scotland: the 2013 Carbon Management Plan for the Scottish Government<sup>65</sup> and Welsh Government's Climate Change Strategy<sup>66</sup>.

The Northern Irish Government also runs a carbon saving scheme but no estimate of these has been provided.

### **(b) target sectors;**

The GGCs include 22 central government departments, their executive agencies, executive non-departmental public bodies and non-ministerial government departments in the United Kingdom. All office and non-office estate and other operational activities are covered by the GGCs. The CMP and the Climate Change Strategy have a similar coverage.

### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

These are provided in Annex B. They are presented as annual savings over the seven year period 2014-20.

### **(d) the duration of the obligation period and intermediate periods**

The UK government's GGCs aim to cut greenhouse gas emissions by 25% in 2015/16 from a 2009/10 baseline. The commitment runs from 2010/11 up to 2015/16 but only savings based on actions taken from 1<sup>st</sup> January 2014 have been included.

The Welsh Government's Climate Change Strategy aims to cut emissions from the Welsh Government admin estate by 35% in 2019/20 from a 2010/11 baseline.

The Scottish Government's Carbon Management Plan has a target of a 30% reduction in CO2 levels by 2020.

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<sup>65</sup> <http://www.scotland.gov.uk/Publications/2009/05/26125414/0>

<sup>66</sup> <http://wales.gov.uk/topics/environmentcountryside/climatechange/publications/strategy/?lang=en>

**(e) eligible measure categories;**

The GGC greenhouse gas reduction target applies to emissions from all buildings unless specifically exempted, and all staff UK business travel. Measures include:

- behaviour change
- facilities management
- estate management & rationalisation
- greening ICT
- energy efficient refurbishment
- on-site renewables
- travel, data and performance management
- improved video / tele-conferencing
- low emission vehicles
- better procurement
- other measures

Measures taken by the devolved administrations are expected to be similar.

**(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

Although the GGCs, Welsh Climate Change Strategy and Scottish Carbon Management Plan set greenhouse gas emissions targets, for the purpose of this analysis, the associated energy savings have been calculated. The energy savings presented for these policies are based on the following assumptions:

Departments have reported their energy consumption for 2013 and 2014. 2013 energy consumption has been subtracted from 2014 energy consumption in order to calculate energy savings in 2014. Departments also forecasted their GGC energy savings in the first quarter of 2015. Given that these are forecasts it is assumed that energy savings for each year since the reference year of 2009/10 also result from actions taken in that year. Figures of energy savings achieved by the Devolved Administrations were taken from DECC's previous work for EED Article 5. Only energy savings above the level required through alternative measures under Article 5 have been included.

In this analysis it has been assumed that 50% of the energy savings are additional to existing measures, i.e. would have been realised without the GGCs. This figure draws upon the non-additionality assumption currently applied to energy savings realised by Salix-funded<sup>67</sup> measures (two thirds) and the proportion of GGC energy savings in 2013/14 and 2014/15 that were not achieved through rationalisation (approximately one third).

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<sup>67</sup> <http://www.salixfinance.co.uk>

**(g) lifetimes of measures;**

While the lifetime savings vary between measures, for simplicity we have assumed that annual savings from each year persist up to at least 2020.

**(h) approach taken to address climatic variations within the Member State;**

The impact of climatic variation, such as varying hours of darkness or heating degree-days, may have on the savings estimated for projects will differ dependent on the type and location of the project being undertaken. As government bodies are aware of the specific climatic variations for their region and how these impact projects, this impact will form part of their estimation of savings prior to submission of their estimates.

**(i) quality standards;**

For the GGCs all Departments are required to report against all targets. Exemptions from reporting may be permitted to arms-length bodies in specific circumstances, including those whose operations occupy less than 1,000m<sup>2</sup> of floor space or employ fewer than 250 staff.

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

For the GGCs Departments report their quarterly energy consumption and hence energy savings relative to the reference year 2009/10 to the Department for Environment, Food and Rural Affairs (Defra). Departments also provide forecasts of their performance against the overall target of 2014/15.

**(k) audit protocols;**

For the GGCs departments should ensure that adequate procedures are in place to validate the data. Consideration should be given to the role of Internal Audit teams in undertaking this role.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of GGCs towards the UK Article 7 target is presented in Annex B.

## **ENGLAND-WIDE ROLL OUT OF RE:FIT**

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

RE:FIT provides a procurement framework to allow public sector bodies to procure energy efficiency improvements to their buildings from Energy Service Companies (ESCOs). It is separate to, but builds on the London RE:FIT initiative run by the Greater London Authority.

### **(b) target sectors;**

All public sector buildings in England.

### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

These are provided in Annex B. These are presented as annual savings over the seven year period 2014-20.

### **(d) the duration of the obligation period and intermediate periods;**

The scheme is currently operational and is funded until March 2016. After this it is expected that the scheme will be partially self-funding and will operate through a rebate-type mechanism.

### **(e) eligible measure categories;**

RE:FIT is an output based procurement tool – as such any energy efficiency building improvement measure is within scope.

### **(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

Energy saving estimates are considered deemed savings which are based on the performance of previous projects under the London RE:FIT scheme, which have been used to estimate:

- The expected number of projects that will be completed each year
- The expected average capital value of projects
- The expected average payback timescale of the projects

This has been used to estimate the average annual energy bill saving arising from the projects, which has been combined with an assumed electricity price to estimate the total energy savings from RE:FIT projects in a particular year out to 2020. This has been done for each of the remaining years of the scheme 2014, 2015, 2016 (assuming that a project generates no savings in the year it was started) and the total energy arising from each year's projects to 2020 has been added together to get the total energy savings from the scheme.

All projects within the scheme are additional and we have assumed that all savings are expressed as electricity.

**(g) lifetimes of measures;**

Given the wide variety of measures, there is a large range of lifetimes for the improvements from 6-15 years.

**(h) approach taken to address climatic variations within the Member State;**

Every proposal under the scheme contains a measurement and verification plan which takes account of climatic variation in calculating the technological savings to be achieved.

**(i) quality standards;**

Quality is assessed on each project with reference to the public body's objectives for the outcomes of that project. Assessment of Quality during evaluation can encompass the contractor's adequacy of resources, their experience on delivering to program and/or the robustness of the measurement and verification plan. Overall the public body is assessing the contractor's ability to deliver alongside its partner fit with the public sector for the duration of the project.

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

Public bodies wishing to procure energy efficiency improvements through the RE:FIT scheme detail the requirement for the tender in terms of the nature of their buildings, the amount of capital they are prepared to invest, the level of energy saving they would like to achieve and the payback periods. A mini procurement competition is then run amongst the pre-tendered panel of 13 ESCOs who will produce bids based on the requirement including visiting the buildings.

The ESCOs will then produce an investment grade proposal including the detailed design of the improvements along with a guaranteed forecast for how the building's energy bills will reduce. The forecast energy savings do not include energy price inflation and exclude savings in maintenance costs.

The performance of the improvements is then monitored through the energy bills of the relevant buildings relative to the ESCO's plan.

**(k) audit protocols;**

Local Partnerships, which runs the England-wide roll-out of RE:FIT, provides DECC with quarterly returns detailing the projects delivered under the scheme and the level of estimated savings attached to each, along with any additional information that is required.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of Re-fit towards the UK Article 7 target is presented in Annex B

## **RAIL ELECTRIFICATION**

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

The Department for Transport has set out its rail electrification policy and the associated funding for nominated schemes through its Rail Investment Strategy. Network Rail, the owner of the rail infrastructure in Great Britain, is responsible for delivering the electrification schemes identified.

### **(b) target sectors;**

Transport sector - railway

### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

The energy savings are set out in Annex B. These represent the net end-use energy savings from the policy.

### **(d) the duration of the obligation period and intermediate periods**

This is a long term policy. Energy savings are presented for action taken between 2014-20 and are presented as annual savings over the seven year period. The savings are based on plans to upgrade particular sections of the UK rail infrastructure over this period.

### **(e) eligible measure categories;**

Rail electrification. The UK Government's investment in rail electrification is driven by the cost savings, carbon benefits and improved reliability and performance of running electric trains instead of diesels. A significant element of the cost savings arise from the improved energy efficiency of electric trains combined with the use of electricity instead of diesel as a fuel. As a specific example, electric trains have the ability to capture and re-use braking energy (through the use of regenerative braking) which, in the case of diesel trains, is simply lost as heat.

### **(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The savings presented for this policy are considered deemed savings based on assumptions about consumption of diesel and electric rail. Savings data is an output of DfT's Rail Emission Model (REM). REM estimates energy consumption of each rail passenger service operating in GB on the basis of each service's characteristics (stock type, stopping pattern, speed, etc.). The model is calibrated to actual annual energy (gas oil and electricity) consumption as reported by individual train operating companies. REM was run twice, once with rail electrification schemes and once without. The expected savings are the difference between the outputs of these two runs, converted to TWh.

**(g) lifetimes of measures**

60 years

**(h) approach taken to address climatic variations within the Member State;**

Not applicable

**(i) quality standards;**

The Department for Transport has defined the broad performance and reliability outputs to be delivered by the electrification system. In the main these will be delivered in compliance with EU technical standards for interoperability.

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

Trains using this new electrification infrastructure will be fitted with energy meters that will accurately measure electricity consumption and allow this to be compared to historic diesel consumption data. In this way the energy and carbon benefits (using diesel and power generating emission factors) can be accurately assessed. In order to be billed for electricity consumption, the electrification infrastructure provider (Network Rail) requires train operators to introduce appropriate monitoring and verification processes and also stipulates minimum accuracy requirements for the electricity meters themselves.

**(k) audit protocols**

As part of its rail franchising programme, the Department for Transport will require operators of train franchises to collect robust data on environmental impacts including energy consumption and carbon emissions. This will need to be independently audited on a regular basis.

**(l) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of Rail Electrification towards the UK Article 7 target is presented in Annex B

## **OFFICE FOR LOW EMISSION VEHICLES (OLEV)**

A description of this policy is reported below using the framework set out in point 4 of Annex V of the Directive

### **(a) obligated, participating or entrusted parties, or implementing public authorities;**

The Office for Low Emission Vehicles (made up of officials from Department for Transport, Department for Business Innovation and Skills, and Department of Energy and Climate Change)

### **(b) target sectors;**

Transport sector - road

### **(c) the level of the energy saving target or expected savings to be achieved over the whole and intermediate periods;**

The energy savings are set out in Annex B. These represent the net end-use energy savings from the policy.

### **(d) the duration of the obligation period and intermediate periods;**

Policy is due to run until 2020. Savings are presented as annual savings over the seven year period. Savings based on vehicles introduced since 2014 have been included in the analysis.

### **(e) eligible measure categories;**

Two schemes run to incentivise low-emission light vehicles (one for vans and one for cars). These cover new cars and vans, with type approval and meeting certain performance criteria, with CO<sub>2</sub> emissions below 75g/km. Manufacturers must demonstrate that vehicles meet these criteria: a list of eligible vehicles is published on the gov.uk website<sup>68</sup>.

The increase in ULEVs will present opportunities for better and more efficient energy management. This will be particularly true with the introduction of intelligent power supply networks (smart grids) and the roll-out of electricity and gas smart meters across domestic properties (and several million smaller non domestic businesses) in Great Britain by 2020.

### **(f) calculation methodology, including how additionality and materiality are to be determined and which methodologies and benchmarks are used for engineering estimates;**

The savings presented for this policy are considered deemed savings based on assumptions about the type of vehicles and the rate of delivery. DfT's ECCo model outputs for ultra-low emission vehicle (ULEV) roll-out were amended to remove the impacts of increased ULEV roll-out before 2014 and to reflect actual sales in 2014. These outputs were entered into the new car CBA model, which estimates total

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<sup>68</sup> <https://www.gov.uk/plug-in-car-van-grants/overview>

energy savings based on ICE and LEV roll-out, mileages and efficiencies. Some policy taking place in, say, 2013 will influence additional roll-out in 2014 - such as infrastructure provision which will remain.

**(g) lifetimes of measures**

The current phase of the grants ends in 2015, but OLEV has recently been allocated additional funding for 2015-2020, with the expectation that such incentives will continue in some form beyond 2015. The [current] typical lifetime of a car is around twelve years, so these vehicles will remain in the fleet until the mid-late 2020s.

**(h) approach taken to address climatic variations within the Member State;** Not applicable

**(i) quality standards;**

Vehicles are accepted onto the scheme on the basis of a clear, published set of eligibility criteria<sup>69</sup>. Applications are assessed by an expert panel and the manufacturer and OLEV sign up to a set of terms contained within a grant offer letter. Claims are processed on an equivalent basis via an online system which automatically moves the claim through a set of steps.

**(j) monitoring and verification protocols and how the independence of these from the obligated, participating or entrusted parties is ensured;**

Dealerships are required to check the identity of grant claimants to ensure they are UK residents. Plug-in grant claims are submitted by dealerships via an online claims portal administered on behalf of OLEV by Ricardo-AEA. The claims progress through a number of stages prior to payment. The key stage is an online verification process which automatically cross checks the vehicle's registration number against the DVLA database to ensure it is an eligible vehicle – ie one that meets the PICG eligibility criteria and is registered for use on UK roads. This process is replaced by a manual check, under an SLA with DVA NI for vehicles in Northern Ireland.

In order to meet our eligibility criteria vehicles must emit less than 75g of CO<sub>2</sub>/km. Vehicles are assessed by a panel of experts on their eligibility criteria, including checking the emissions of the vehicles. We have collated data for each vehicle sold so would be able to release information that showed how many vehicles emitting a certain level of CO<sub>2</sub> had been sold.

**(k) audit protocols**

8% of claims are randomly selected for audit through the online claims process. Those selected are required to produce additional documentation including invoices to demonstrate that a sale of an eligible vehicle took place, and that the grant was

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<sup>69</sup> <https://www.gov.uk/government/publications/plug-in-car-grant>

applied correctly. The whole grant claim system is subject to DfT audits. The last audit was conducted in late 2012.

**(I) how the need to fulfil the requirement in the second subparagraph of Article 7(1) is taken into account.**

The contribution of OLEV towards the UK Article 7 target is presented in Annex B.