

## Calculation of the ECO targets in the Final Impact Assessment

### Background

The purpose of this note is to clarify how the ECO targets were calculated. This note draws on analysis presented in the Final Green Deal and ECO Impact Assessment (IA). All modelling results have a degree of uncertainty and are heavily dependent on the model design and the input data and assumptions. The estimated trajectories of uptake of measures and Green Deal finance should not be seen as defining DECC's ambition for the Green Deal, and there are several factors that could mean that our central projections of Green Deal uptake could turn out to be cautious.

Under the ECO, obligated energy companies will be required to deliver **20.9 MtCO<sub>2</sub> (Carbon Savings Obligation) / 6.8 MtCO<sub>2</sub> (Carbon Savings Communities Obligation) lifetime carbon savings** (the Carbon Targets) and achieve a total **reduction in lifetime notional space and water heating costs of £4.2bn** (the Affordable Warmth target) by March 2015. Companies will comply with the obligation by installing eligible insulation and heating measures.

The central estimate of the **cost of meeting the ECO targets is £1.3bn p.a.** to 2022, and is the sum of the costs associated with meeting the ECO carbon targets (£950million p.a. on average) and the Affordable Warmth target (£350m p.a. on average). The estimated cost for the period to March 2015 is £2bn and £785m for the Carbon Target and Affordable Warmth target respectively<sup>1</sup>.

### Carbon Targets – carbon savings

Under the Carbon Targets, which comprise the Carbon Saving Obligation (CSO) and the Carbon Saving Communities Obligation (CSC), we estimate that around 146,600 Solid Wall Insulation (SWI), 554,600 Cavity Wall Insulation (CWI) and 185,100 Loft Insulation (LI) measures fully or partly financed by ECO subsidy would be installed to March 2015. The targets are estimated by multiplying the number of measures taken up by the measures' estimated lifetimes, the energy savings from these, and the carbon intensity of the fuel saved<sup>2</sup>. The ECO carbon targets are therefore estimated as follows<sup>3</sup>:

#### Carbon Saving Obligation (20.9MtCO<sub>2</sub>)

107,500 SWI	$\times 36^4 \times 5,000 \times 0.28^5 = 5.37\text{MtCO}_2$
256,300 CWI	$\times 42 \times 4,300 \times 0.20 = 9.43\text{MtCO}_2$
116,800 CWI&LI	$\times 42 \times 5,400 \times 0.22 = 5.70\text{MtCO}_2$

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<sup>1</sup> We expect the average annual ECO spend to be £1.3bn, however we expect annual spend to rise across the period due to the cost of carry (see final paragraph). The estimated total spend to March 2015 comprises the entire 2013 and 2014 estimates in addition to ¼ of the entire 2015 estimate.

<sup>2</sup> Number of measures x lifetime x energy saving (kWh, before comfort taking) x carbon intensity = Lifetime carbon saving. Carbon intensity is quoted in kg CO<sub>2</sub> per kWh fuel

<sup>3</sup> Uptake levels, average energy saving and average carbon intensities presented have been rounded

<sup>4</sup> Measure lifetimes were determined by BRE through their SAP and RdSAP methodologies.

<sup>5</sup> The weighted average fuel intensity of each measure in each carbon obligation is presented above. This is determined by the uptake profile predicted by the Green Deal Household Model. Because ECO subsidy is apportioned according to carbon savings, households heated by carbon intensive fuels are predicted to receive higher levels of subsidy, therefore the model predicts these households to be more likely to take up a measure.

In addition to the above savings from the main insulation measures, the carbon savings from other secondary measures (e.g. loft insulation with SWI, and glazing) packaged with Hard To Treat CWI or SWI eligible for ECO is around 0.4 MtCO<sub>2</sub>.

There are no targets from individual measures.

#### Carbon Saving Communities Obligation (6.8MtCO<sub>2</sub>)

39,100 SWI	x 36 x 3,900 <sup>6</sup>	x 0.28 = 1.54MtCO <sub>2</sub>
142,200 CWI	x 42 x 2,700	x 0.21 = 3.39MtCO <sub>2</sub>
29,000 LI	x 42 x 770	x 0.24 = 0.23MtCO <sub>2</sub>
39,300 CWI&LI	x 42 x 4,100	x 0.22 = 1.49MtCO <sub>2</sub>

In addition to the above savings from the main insulation measures, the carbon savings from other measures eligible for the Carbon Saving Communities Obligation is around 0.2 MtCO<sub>2</sub>.

The estimated uptake of individual measures is subject to a range of assumptions and uncertainties, but is based on the best available evidence on consumers' likely demand. Actual uptake of different measures, and therefore the share of the carbon target met by these, will depend on the energy companies' targeting of different property types and measures.

#### **Carbon Targets – cost of meeting targets**

The average *installation* cost for the main insulation measures are assumed to be the following:

- £500-£1,875 for CWI (Easy and Hard To Treat respectively)
- £5,300-£9,950 for SWI (for internal and external respectively)
- £300 for LI

If companies paid the full installation costs of the ECO Carbon Target eligible measures taken up, the total *installation* costs associated with the uptake of measures to March 2015 would be around **£1.85bn**.

116,700 SWI (int.)	x £5,300	= £619m
29,900 SWI (ext.)	x £9,950	= £298m
115,100 CWI (easy)	x £500	= £58m
439,400 CWI (hard)	x £1,875	= £824m
185,100 LI	x £300	=£56m

#### Total carbon target installation costs =£1.85bn<sup>7</sup>

However, we recognise that in reality, the full cost of delivering measures will include non-installation costs and that some households may receive ECO subsidies in excess of the installation cost.

- The administrative cost associated with the ECO (carbon) and Green Deal framework will depend on the length of the Green Deal plan, and is estimated at around £300 per

<sup>6</sup> Weighted average energy savings of ECO-supported measures differ in CSC compared with CSO for two reasons: a) the average house in the CSC is considerably smaller than in the CSO, in the region of a 20% smaller external wall area, and b) the brokered carbon price is predicted to be higher in the CSO, therefore the model predicts higher subsidy levels for HTT CWI (ETT CWI cannot be subsidised in the CSO), thus increasing uptake levels in the more cost effective households and therefore increasing the average energy saving in the CSO.

<sup>7</sup> Figures do not add up due to rounding

plan. This administrative costs includes an assessment cost of £112.5 per plan, as well as costs associated with unsuccessful assessments, a set-up fee and other annual administrative costs of the plan.

- If a market price for ECO carbon target delivery prevails, and all companies subsidise measures at this market rate, then the cheaper measures may get subsidised at more than 100% of their installation costs. We estimate that around 40% of all measures delivered under the ECO Carbon Targets could receive subsidies in excess of their installation costs.

However, it is important to note that we do not assume that the full cost associated with delivering the ECO Carbon Targets will be subsidised by the energy companies, as some of the measures are likely to be part-funded by Green Deal or other finance. For example, we have estimated that, on average, around 50% of the full cost of an external SWI taken up will be paid for by Green Deal finance.

Taking into account all these cost assumptions and potential market factors, we estimate that the total cost to suppliers of meeting the ECO carbon targets is around **£2bn to March 2015<sup>8</sup>**.

### **Affordable Warmth Target – home heating cost reduction**

Under the Affordable Warmth Target we estimate that around 260,000 new and replacement heating systems, 45,000 Cavity Wall Insulation (CWI) and 90,000 Loft Insulation (LI) measures will be installed to March 2015. We anticipate that all Affordable Warmth measures will be fully financed through ECO subsidy.

The target is estimated by multiplying the number of measures taken up by the measures' lifetimes, and the estimated notional space and water heating savings that these generate<sup>9</sup>. The ECO Affordable Warmth target is therefore estimated as follows<sup>10</sup>:

45,000 CWI	x 42 x £155	= £293m
90,000 LI	x 42 x £50	= £189m
260,000 heating systems	x 12 x £1,200	= £3,744m

The total ECO Affordable Warmth target is therefore a **£4.2bn reduction in lifetime notional space and water heating costs**.

The estimated uptake of individual measures under the Affordable Warmth target is also subject to a range of assumptions and uncertainties, but is based on the best available evidence on the relative attractiveness of fully subsidised measures and informed by similar previous Government sponsored schemes. Actual uptake of different measures, and therefore the share of the Affordable Warmth target met by these, will depend on the energy companies' targeting of different property types and measures.

### **Affordable Warmth – cost of meeting target**

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<sup>8</sup> 2013 = £787m, 2014 = £958m, 2015 = £1,066m, therefore ECO carbon target spend is £2bn to March 2015. See footnote 1 to explain the rising profile of ECO spend

<sup>9</sup> Number of measures x lifetime x notional saving in space and water heating = Lifetime notional reduction in home heating costs. "Notional space heating costs" is defined as the cost of heating a dwelling's main living area to 21°C and all other living areas to 18°C.

<sup>10</sup> Uptake levels and notional bill savings per measure presented have been average over the period to March 2015 and rounded.

The average *installation* cost for the main heating and insulation measures are assumed to be the following:

- £500-£1,875 for CWI (Easy and Hard To Treat respectively) – it is anticipated that the majority of CWI installed under Affordable Warmth will be easy to treat
- £5,300-£9,950 for SWI (for internal and external respectively) – it is expected that no SWI will be installed under Affordable Warmth before March 2015
- £300 for LI; and
- £2,000-£6,500 for a new or replacement heating system (the average heating installation under Affordable Warmth is estimated to be around £2,200).

Energy companies are anticipated to fund the full installation costs of the Affordable Warmth eligible measures taken up, with the total *installation* costs associated anticipated to be around **£622m** to March 2015.

45,000 CWI	x £500	= £23m
90,000 LI	x £300	= £27m
260,000 new/replacement heating systems	x £2,200	= £572m

Total Affordable Warmth target installation costs =£622m

However, we recognise that in reality, the cost to suppliers of delivering Affordable Warmth is not simply the installation costs. The full costs will also include elements of administrative costs and capture the possibility that some households may receive ECO subsidies in excess of the installation cost.

- Administrative costs includes an assessment cost of around £100 per household where measures are installed, as well as a further allowance for additional costs, such as follow up inspections of heating systems, of around £60 per household.
- If a market price for ECO Affordable Warmth compliance prevails, and all companies subsidise measures at this market rate, then the cheaper measures may get subsidised at more than 100% of their installation costs. We anticipate that all measures delivered under the Affordable Warmth target will be fully subsidised, and estimate that about 85% of these could receive subsidies in excess of their installation costs.

Taking into account all these cost assumptions and potential market factors, we estimate that the total cost to suppliers of meeting the ECO Affordable Warmth target is around **£785m to March 2015<sup>11</sup>**.

## Uncertainties

As with any modelling, the estimated uptake trajectories are subject to a wide range of uncertainties. This is reflected in the sensitivity scenarios analysed in the Green Deal and ECO Final Impact Assessment<sup>12</sup>. The uptake of measures in the real world will depend on a range of factors such as consumers' appetite for measures, the marketing strategy of the obligated energy companies and energy prices.

## Cost of Carry

<sup>11</sup> 2013 = £350m, 2014 = £350, 2015 = £340 therefore ECO AW obligation spend is £785m to March 2015. See footnote 1 to explain the rising profile of ECO spend

<sup>12</sup> <http://www.decc.gov.uk/assets/decc/11/consultation/green-deal/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf>

DECC estimates the cost of complying with ECO will rise over time but average £1.3bn per annum. The reason for this is due to the cost of carry, which is the recognition that there is an opportunity cost to complying with an obligation early. This opportunity cost to companies is that the funds they use to deliver measures to comply with the obligation could be used for other purposes with an internal return. Therefore, we expect energy companies to deliver a rising profile of effort over time as a result of this.