

**The Green Deal and Energy Company  
Obligation**

**Scenario Modelling of Insulation  
Installation**

**A report for Knauf Insulation**

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## EXECUTIVE SUMMARY

- 1 This report examines the immediate impact that the introduction of the Green Deal will have on the take up of loft insulation (LI) and cavity wall insulation (CWI) and the effect on installers of insulation. We compare the impact of government's preferred option, set out in the recent DECC Consultation Document (DECC Option 2), with alternative scenarios. We show that encouraging the take-up of LI and CWI will produce greater benefits in terms of lower energy bills, further reductions in CO<sub>2</sub> emissions and inclusion of more homes than the government's preferred option. We also show how this can be achieved without adding to the costs (already assumed by DECC) that would need to be recovered from customers through energy bills.
- 2 Under the government's preferred option, rates of take-up of LI and CWI would fall rapidly from the levels of recent years. This reduction would leave a substantial volume of cost effective energy efficiency measures unexploited and thereby slow down the reduction in CO<sub>2</sub> emissions from housing.
- 3 Government has also assumed a rapid take-up of solid wall insulation (SWI). Industry considers that this is unrealistically high and would, if DECC's anticipated demand were realised, be likely to lead to price increases because of shortage of suppliers and/or to inferior quality work from installers who were not fully trained. Either of these outcomes would discredit SWI and, by association the Green Deal, in the eyes of householders. For our alternative scenarios we have assumed lower rates of take-up of SWI.
- 4 We have analysed a number of alternative scenarios based on different rates of installation of the three types of insulation, details are given in the full report. The two most attractive options, taking into account costs, benefits and funding issues assume higher take-up of both LI and CWI over the ten year period. The first scenario, (ECO Plus), with higher take-up of insulation measures, would require additional funding through ECO. This scenario assumes the same total number of SWI installations as DECC Option 2 by 2022 but with a slower year by year build up. The second scenario, (ECO Neutral), models a lower take-up of SWI and would have the same ECO cost as the government's preferred option. The ECO Neutral scenario is more cost effective than either DECC Option 2 or the ECO Plus scenario.

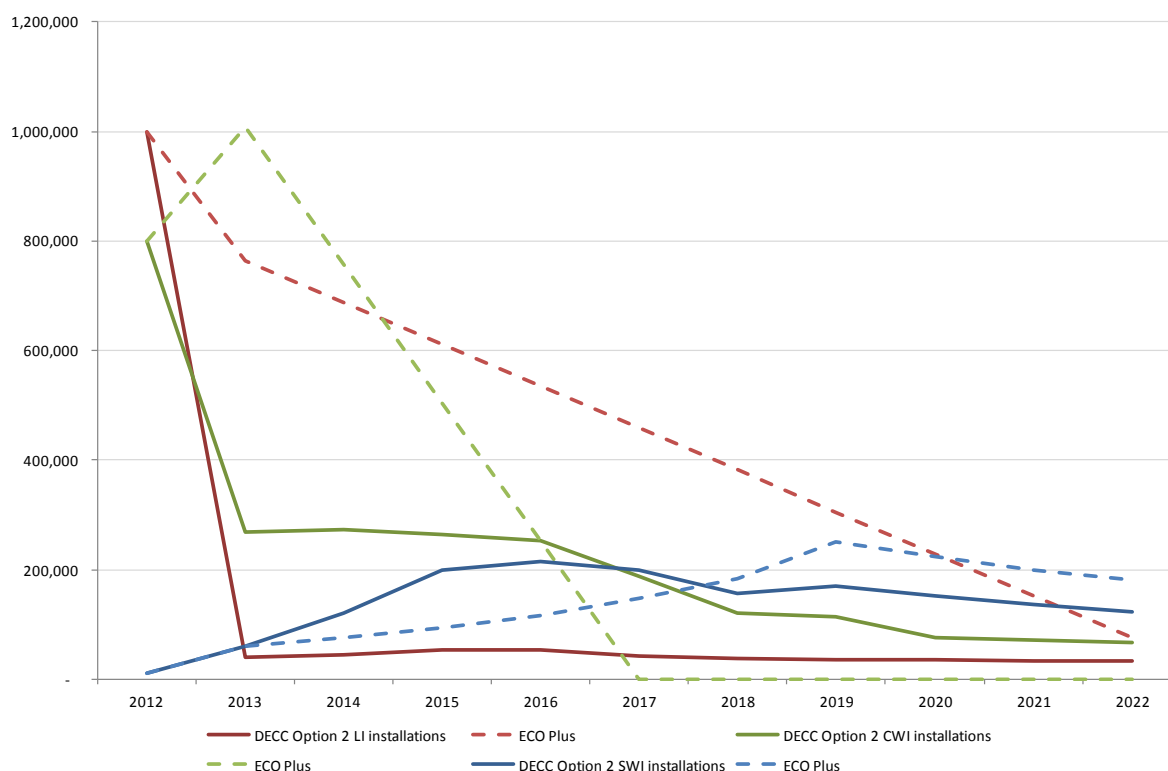
### ECO Plus

- 5 In the ECO Plus scenario a target of over 4 million LI installations is achieved over the ten years to 2022, with higher rates in the earlier years tapering off to avoid a cliff edge at the end of the period. A target of 2.5 million CWI installations is achieved by 2017. This is shown in Figure 1 in comparison with DECC Option 2.
- 6 In order to achieve the higher rates of take-up of LI and CWI assumed in ECO Plus, it would be necessary to offer additional financial incentives under ECO. For illustration we have assumed that 50 per cent of the cost of LI and CWI is met by energy companies under ECO and the cost recovered by a surcharge on all domestic energy bills. The



costs of support for LI and CWI on this basis would add about £13 to the average household bill in 2013 on top of the SWI support already assumed under DECC Option 2. These additional costs would vary from year to year as the rate of installation changes. In some years this scenario would impose less cost than DECC Option 2. Over 10 years the annual average addition to household energy bills under ECO Plus would be about £4.50.

**Figure 1: ECO Plus**

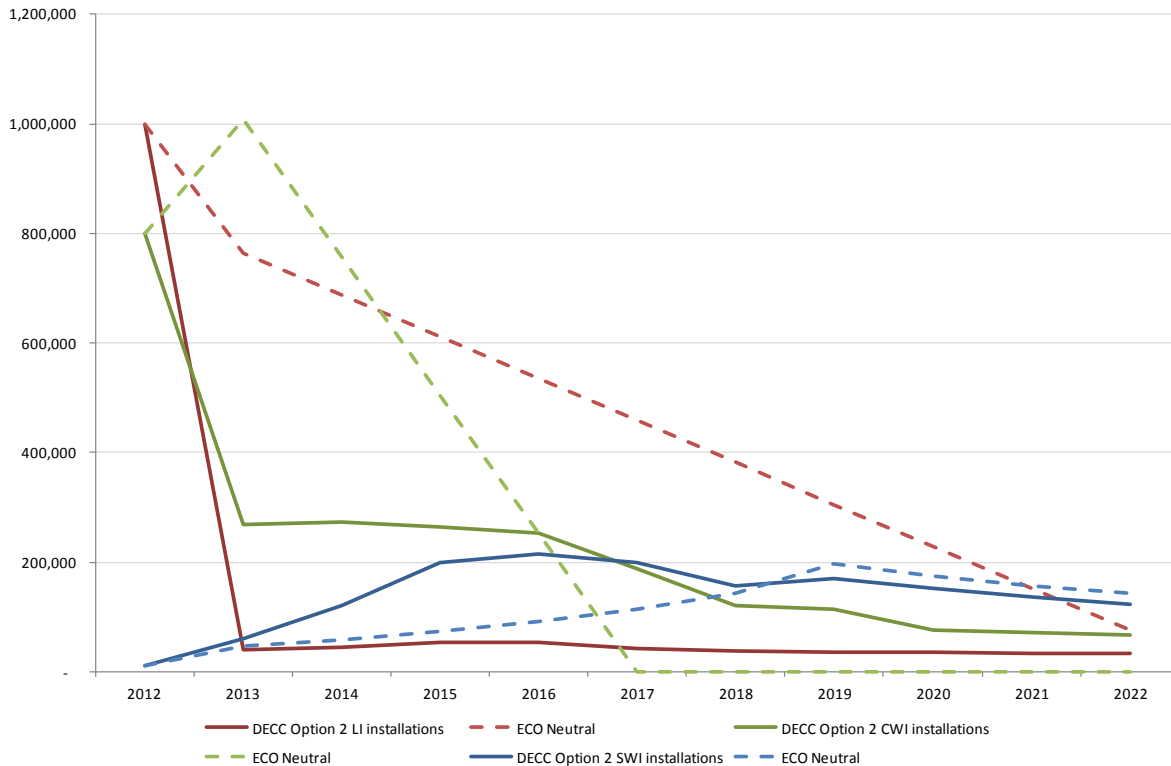


### ECO - Neutral

7 This addition to energy bills could be avoided if the take-up of the measures supported under ECO was reduced. We have modelled the ECO Neutral scenario so that over the life of the policy the ECO costs of the measures included are the same as the cost assumed in DECC Option 2. Since SWI is the most costly of the measures considered here, the ECO Neutral outcome can most easily be achieved by a reduction in the numbers of SWI installations over the period to 2022. This may be realistic, taking into account industry expectations on capacity and demand over the period. The total number of houses being treated with SWI would be about 330,000 lower over the ten year period. This is 20 per cent below the level assumed in DECC Option 2 and the ECO Plus scenario. The levels of LI and CWI installations are the same as in the ECO Plus scenario. This is shown in Figure 2.



**Figure 2: ECO Neutral**



**Costs and benefits**

- 8 The analysis of costs and benefits for these scenarios takes into account the cost of installing insulation and the benefits in terms of lower energy consumption and reductions in CO<sub>2</sub> emissions. For both scenarios, (even with lower levels of SWI), the net economic benefit and the reduction in the volume of CO<sub>2</sub> is greater than under DECC Option 2. For the ECO Plus scenario net benefits are £6 billion greater than DECC Option 2. For the ECO Neutral scenario the additional net benefits are £5 billion. The net benefits per tonne of CO<sub>2</sub> are higher and target reductions in CO<sub>2</sub> can be met earlier. These represent net benefits to the economy as a whole. Under our scenarios up to 1.6 million more homes could benefit from additional insulation over the period to 2022 than has been assumed by DECC.
  
- 9 Under the ECO Plus scenario additional costs, (compared to DECC Option 2), to be passed on to consumers would be in the region of £1.2 billion over ten years. Under – ECO Neutral there would be no additional costs to be passed to consumers. The net benefit per tonne of CO<sub>2</sub> abated provides a measure of the cost effectiveness of each option. With a net benefit of £138 per tonne of CO<sub>2</sub> the ECO Neutral scenario is the most cost effective of the three considered here. A summary of costs and benefits is shown in Table 1.

**Table 1: Costs and benefits of alternative scenarios**

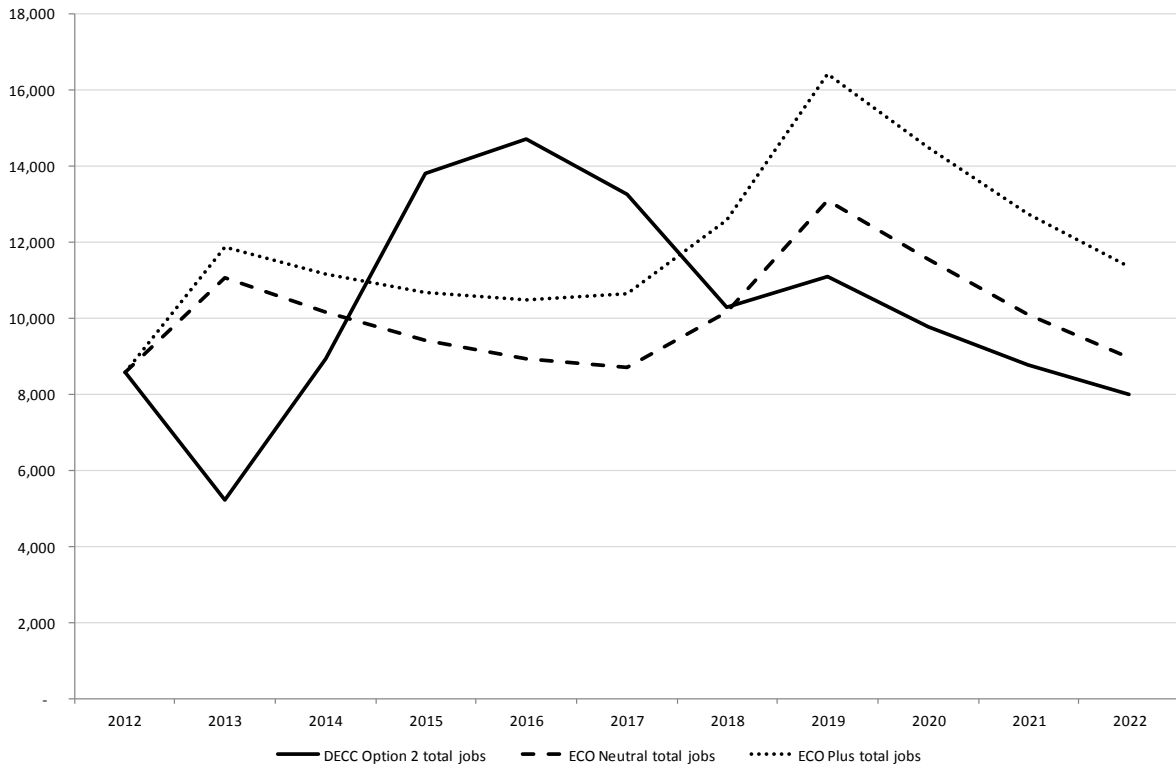
	<b>DECC Option 2</b>	<b>ECO Plus</b>	<b>ECO Neutral</b>
	DECC LI 2013-2022	High LI 2013-2022	High LI 2013-2022
	DECC CWI 2013-2022	High CWI 2013-2017	High CWI 2013-2017
	Revised DECC SWI 2013-2022	Smaller initial SWI 2013-2022	Reduced SWI 2013 - 2022
Net benefits (£ million)	£9,301	£15,284	£14,335
Net benefits relative to DECC Option 2 (£ million)	-	£5,983	£5,034
CO <sub>2</sub> savings (million tonnes)	90.2	117.0	104.2
CO <sub>2</sub> savings relative to DECC Option 2 (million tonnes)	-	26.7	13.9
£benefit/tonne CO <sub>2</sub> saved	£103	£131	£138
ECO costs (£million)	£6,513	£7,773	£6,513
Year in which 1.95 MtCO <sub>2</sub> target reached	2020	2018	2019

## Employment impact

- 10 We have also looked at the possible impact of these alternative scenarios on employment. The principal impact would be on the insulation installation sector. Under the government's option there could be an initial loss of about 3,000 jobs in LI and CWI installation in the first year followed by an increase in SWI employment. However it cannot be assumed that there is a smooth transition in employment from one type of installation to another. Under our alternative scenarios a smoother transition could be achieved. Under ECO Plus there could be around 1,800 additional jobs on average over the life of the policy although this would vary from year to year. The ECO Neutral scenario would be broadly job neutral over the period. The pattern of employment under each scenario is shown in Figure 3.



**Figure 3: Employment under ECO Plus and, ECO Neutral and DECC Option 2**





## 1 INSULATION IN DOMESTIC BUILDINGS UNDER THE GREEN DEAL

- 1.1 This report examines the immediate impact that the introduction of the Green Deal will have on the take-up of loft insulation (LI) and cavity wall insulation (CWI) and the effect on installers of insulation. It goes on to assess the costs and benefits of alternative scenarios in which incentives are given to encourage higher take-up of these insulation measures in an enhanced combination of the Green Deal and the Energy Company Obligation (ECO) carbon target. These scenarios are compared with the government's preferred option for the Green Deal and ECO as set out in the Consultation Document and Impact Assessment.<sup>1</sup> We show that encouraging the take-up of LI and CWI would produce greater benefits in terms of lower energy bills, further reductions in CO<sub>2</sub> emissions and inclusion of more homes. We also show how this can be achieved without adding to the costs (already assumed by DECC) that would need to be recovered from customers through energy bills.
- 1.2 The Consultation Document sets out three options for the Green Deal and ECO. The preferred option, referred to here as DECC Option 2, combines Green Deal finance for energy efficiency measures meeting the Golden Rule (i.e. the savings to householders from reduced energy consumption will be greater than the cost of installing the measures) with some funding from energy companies under ECO for solid wall insulation (which is not expected to meet the Golden Rule). No separate funding is proposed for LI or CWI under the ECO carbon target. These measures are expected to meet the Golden Rule and form part of Green Deal packages. In the past LI and CWI installation has been funded by energy companies most recently under CERT.

### The Impact of the Green Deal on LI and CWI

- 1.3 In the year to April 2011 around 1 million homes benefited from installation of LI. It is estimated that there are still 6 million to 9 million houses which are yet to benefit from full loft insulation.<sup>2</sup> Around 800,000 CWI installations are expected to be completed in 2012.<sup>3</sup> It is estimated that there are still between 1.4 million and 3.6 million untreated homes with easy to fill cavity walls. The costs of LI and CWI and the potential energy savings are set out in the Consultation Document and these measures are recognised as being amongst the most cost effective ways of saving energy in homes.<sup>4</sup>
- 1.4 Under DECC Option 2, the annual rate of CWI would fall to around 270,000 in the early years and fall further over the life of the scheme made up of a mix of easy to fill and more

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<sup>1</sup> The Green Deal and Energy Company Obligation. Consultation Document. DECC November 2011.

The Green Deal and Energy Company Obligation. Impact Assessment. DECC November 2011. (hereafter DECC IA)

<sup>2</sup> The DECC IA gives an estimate of 6 million (Table 5). Industry estimates suggest a higher value of 9 million (*Association for the Conservation of Energy*)

<sup>3</sup> DECC IA, Figure 16.

<sup>4</sup> DECC IA, Figures 12 and 13.





difficult cavities. This represents a reduction of 60 to 70 per cent in the annual rate of installation. The expected impact on LI is even more dramatic. Only about 40,000 homes a year are projected to take up LI under the Green Deal, 400,000 over the next ten years – well below the potential of 6 million to 9 million homes. This reduction in LI and CWI will leave a substantial volume of cost effective energy measures unexploited and thereby slow down the reduction in CO<sub>2</sub> emissions from housing.

- 1.5 Alongside these reductions in LI and CWI the government is projecting a rapid increase in the take-up of solid wall insulation (SWI) rising from around 10,000<sup>5</sup> in the year to April 2011 to over 150,000 in the first year of the Green Deal with further increases in later years.<sup>6</sup> Provision of funding under ECO is one of the drivers for this change.
- 1.6 The major changes in demand for insulation products that government is projecting as a result of the Green Deal will result in serious disruption in the supply industries. Reduction on the scale anticipated for CWI and even more so for LI will have an immediate impact on the livelihoods of installers and on the manufacturers of insulation material. At the same time a rapid increase in demand for SWI is likely to result in shortages of skilled installers which may impact price and quality as well as having an adverse effect on public perceptions.

### Take up of SWI under the Green Deal

- 1.7 DECC's IA published in November 2011 assumes that in the first year of the Green Deal there will be over 150,000 houses treated with SWI. This is expected to rise to 190,000 in 2016 with a total of 1.5 million over the 10 years to 2022. The insulation industry considers such a rapid take-up of SWI, from DECC's starting base of around 10,000<sup>7</sup> a year, to be unrealistic. Retraining of operatives and accreditation of installers cannot be achieved on that scale in so short a period. In addition to supply constraints, there is not yet clear demand for SWI. Initial evaluation of the Welsh government's arbed scheme, in which SWI was a significant and fully funded component, concluded that "It takes time to engage and encourage homeowners, tenants and landlords to take part in a home energy improvement scheme like arbed... A clear, planned engagement strategy, including plans for discussions on the doorstep and in the home, is needed."<sup>8</sup>
- 1.8 SWI in 60,000 homes is considered by the industry to be a realistic target for the first year of the Green Deal. A 25 per cent annual increase on this number is also considered realistic over the 10 years to 2022 although this could be higher if support is provided for additional training. A faster ramp up in the rate of installation in the early years of the Green Deal would be likely to lead to price increases because of shortage of suppliers

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<sup>5</sup> This figure appears in the DECC Impact Assessment, but may represent CERT activity only. The total numbers of SWI in the retrofit market are nearer 30,000.

<sup>6</sup> DECC IA (para 2.3.1)

<sup>7</sup> Ibid.

<sup>8</sup> Arbed phase 1 – post installation review



and/or to inferior quality work from installers who were not fully trained. Either of these outcomes would discredit SWI and, by association, the Green Deal in the eyes of householders.

- 1.9 Since publication of the IA, DECC has reduced its assumption of the numbers of SWIs in the first three years of the scheme from 515,000 to 380,000 but is still assuming a rapid growth in take-up above the rate considered achievable by the industry. In our analysis we have taken DECC's revised assumptions about take-up in evaluating DECC Option 2, but have assumed the slower annual build up in the number of installation put forward by the industry in evaluating alternative scenarios.

## Transition Scenarios

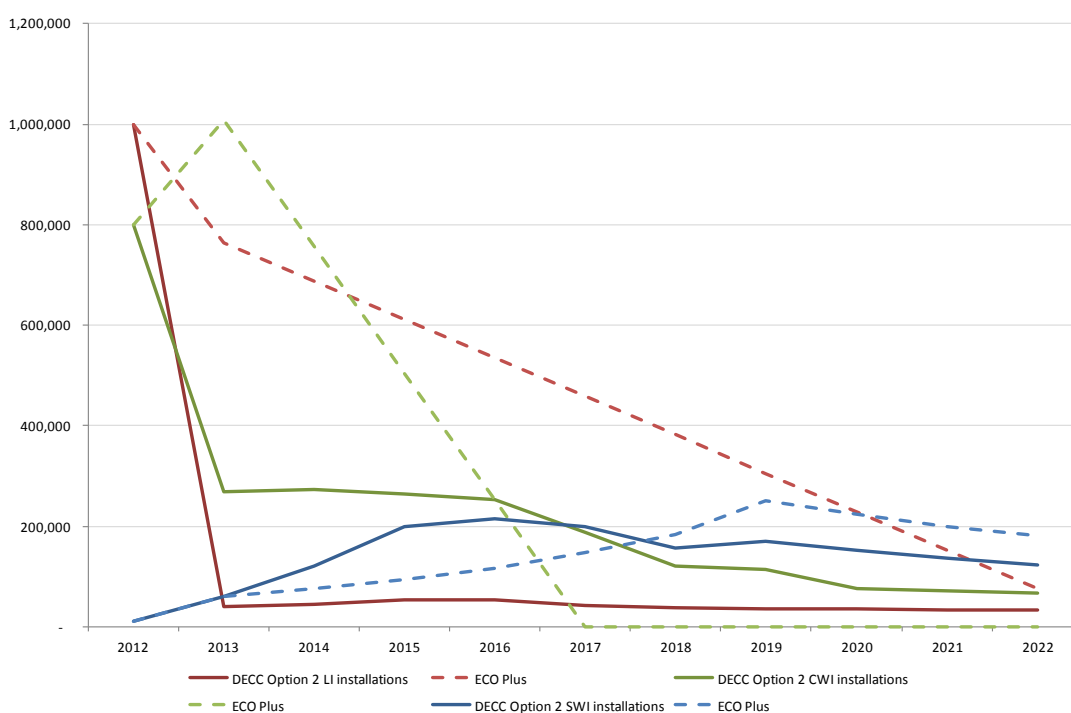
- 1.10 We have developed a simple spreadsheet model of the costs and benefits of different rates of take-up of insulation measures in houses. This allows us to compare the government plans with alternatives. As far as possible we have used the same assumptions as DECC for the costs of installation and for valuing the benefits in terms of energy saved and CO<sub>2</sub> emission reduction.
- 1.11 Installation rates under DECC Option 2 and installation costs have been taken from the Consultation Document and Impact Assessment and related studies. Values for energy savings, CO<sub>2</sub> reductions and discount rates have been taken from HM Treasury guidance. For the purpose of this comparison we have only considered LI, CWI and SWI; other energy efficiency measures such as new boiler installations have been assumed to be the same in all scenarios.
- 1.12 Two preferred scenarios, taking into account costs, benefits and funding issues, have been examined in detail and compared with DECC Option 2.. A number of further scenarios are included in Appendix 1 to illustrate the impact on our findings of changes in key assumptions.
- 1.13 For each scenario we have estimated:
- The net cost or benefit taking into account installation costs, energy savings and CO<sub>2</sub> reductions;
  - CO<sub>2</sub> savings in the years to 2022, the point at which the government target is met; and a measure of cost effectiveness.
  - The costs to be borne through ECO which would be passed on to energy customers and the level of Green Deal funding; and
  - Levels of employment in the insulation installation sector.



## Preferred scenarios

- 1.14 The preferred scenarios assume higher take-up of both LI and CWI over the ten year period. The first scenario, (ECO Plus), with higher take-up of insulation measures, would require additional funding through ECO. In this scenario we assume the same total number of SWI installations as DECC Option 2 by 2022 but with a slower year by year build up. The second scenario, (ECO Neutral), models a lower take-up of SWI and would have the same ECO cost as the government's preferred option.
- 1.15 In the ECO Plus scenario a target of over 4 million LI installations is achieved over the ten years to 2022, with higher rates in the earlier years tapering off to avoid a cliff edge at the end of the period. A target of 2.5 million CWI installations (all of which are assumed to be in the 'easy to fill' category) is achieved by 2017. This is shown in Figure 1.1 in comparison with DECC Option 2.

**Figure 1.1: ECO Plus**



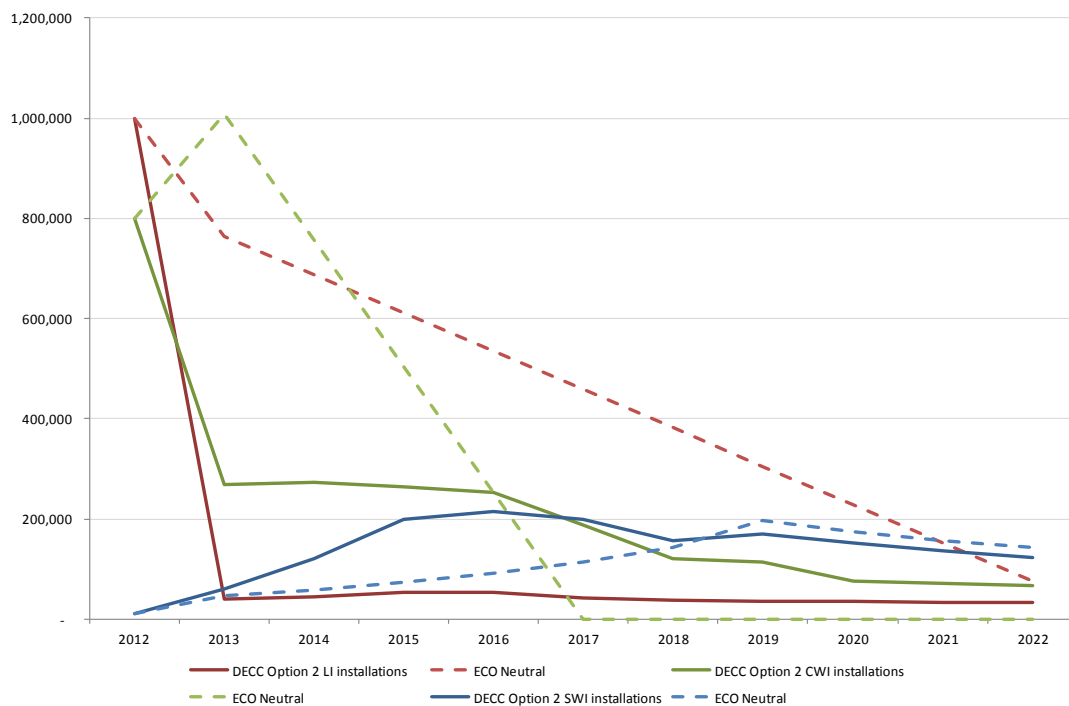
Source: Europe Economics

- 1.16 In order to achieve the higher rates of take-up of LI and CWI assumed in ECO Plus, it would be necessary to offer additional financial incentives under ECO. For illustration we have assumed that 50 per cent of the cost of LI and CWI is met by energy companies and the cost recovered by a surcharge on all domestic energy bills. This addition to energy bills could be avoided if the take-up of the measures supported under ECO was reduced.
- 1.17 We have modelled the ECO Neutral scenario so that over the life of the policy the ECO costs of the measures included are the same as the cost assumed in DECC Option 2.



Since SWI is the most costly of the measures considered here, the ECO Neutral outcome can most easily be achieved by reducing the number of SWI installations over the period to 2022. The total number of houses being treated with SWI would be about 330,000 lower over the ten year period – however, the insulation industry would have time to re-skill to meet customer demand in a sustainable manner. This is 20 per cent below the level assumed in DECC Option 2 and the ECO Plus scenario. The levels of LI and CWI installations are the same as in the ECO Plus scenario. This is shown in Figure 1.2

**Figure 1.2: ECO Neutral**



1.18 Differences in the rates of take-up of SWI between the scenarios are shown in Figure 1.3.



**Figure 1.3: SWI installation rate for ECO Plus, ECO Neutral and DECC Option 2**



Source: Europe Economics

### Costs and benefits

- 1.19 Analysis of alternative scenarios shows the net benefit to society that can be achieved in terms of energy saving and carbon reduction by alternative approaches. In addition, smoothing the transition to the new policy rather than having a ‘cliff-edge’ change can allow adjustments to take place in the supply chain which will avoid the loss of employment and output identified with the early years of Option 2 as presently planned.
- 1.20 The results from the modelling of these scenarios are shown in Table 1.1. The net benefits shown here represent the energy savings achieved and the value attached to CO<sub>2</sub> savings (in the non-traded sector) less the costs of the installation of LI, CWI and SWI. These represent net benefits to the economy as whole. The issue of the distribution of costs and benefits between different groups is considered further below.
- 1.21 This analysis shows that under both scenarios and even with lower levels of SWI, the net economic benefit and the reduction in the volume of CO<sub>2</sub> is greater than under the government’s Option 2. For the ECO Plus scenario net benefits are £6 billion greater than DECC Option 2. For the ECO Neutral scenario the additional net benefits are £5 billion. Under both scenarios the benefits per tonne of CO<sub>2</sub> are higher and target reductions in CO<sub>2</sub> can be met earlier. The estimated ECO cost of ECO Plus is £1.2 billion higher over the ten years of the policy than DECC Option 2 or the ECO neutral scenario.



1.22 The net benefit per tonne of CO<sub>2</sub> abated provides a measure of the cost effectiveness of each option. With a net benefit of £138 per tonne of CO<sub>2</sub> the ECO Neutral scenario is the most cost effective of the three considered here. This reflects the reduction in the number of relatively high cost SWI installations.

**Table 1.1: Costs and benefits of alternative scenarios**

	<b>DECC Option 2</b>	<b>ECO Plus</b>	<b>ECO Neutral</b>
	DECC LI 2013-2022	High LI 2013-2022	High LI 2013-2022
	DECC CWI 2013-2022	High CWI 2013-2017	High CWI 2013-2017
	Revised DECC SWI 2013-2022	Slower take-up rate for SWI 2013-2022	Reduced SWI 2013 - 2022
Net benefits (£ million)	£9,301	£15,284	£14,335
Net benefits relative to DECC Option 2 (£ million)	-	£5,983	£5,034
CO <sub>2</sub> savings (million tonnes)	90.2	117.0	104.2
CO <sub>2</sub> savings relative to DECC Option 2 (million tonnes)	-	26.7	13.9
£benefit/tonne CO <sub>2</sub> saved	£103	£131	£138
ECO costs (£million)	£6,513	£7,773	£6,513
Year in which 1.95 MtCO <sub>2</sub> target reached	2020	2018	2019

Source: Europe Economics

### **ECO support**

1.23 If the levels of LI and CWI envisaged in our scenarios are to be achieved then householders will need additional incentives to take up the measures – as has been the case with CERT/CESP. For illustrative purposes we have assumed that 50 per cent of the LI and CWI costs associated with these higher levels of installation would be met through ECO with householders bearing the remaining 50 per cent. This is lower than the average of 57 per cent support which DECC has assumed for SWI. We have used this level of support for SWI in the analysis of our scenarios.

1.24 The cost of ECO support on this basis for each of the years from 2013 to 2022 is shown in Table 1.2. The remaining funding for these installations is assumed to come through the Green Deal.



**Table 1.2: ECO and Green Deal costs (£ million)**

Year	DECC Option 2			ECO Plus			ECO Neutral		
	ECO	Green Deal	Total	ECO	Green Deal	Total	ECO	Green Deal	Total
2013	£290	£365	<b>£655</b>	£657	£585	<b>£1,242</b>	£594	£538	<b>£1,133</b>
2014	£571	£581	<b>£1,151</b>	£650	£562	<b>£1,213</b>	£574	£505	<b>£1,079</b>
2015	£925	£845	<b>£1,770</b>	£659	£550	<b>£1,209</b>	£566	£480	<b>£1,046</b>
2016	£961	£896	<b>£1,858</b>	£684	£551	<b>£1,236</b>	£572	£467	<b>£1,039</b>
2017	£852	£866	<b>£1,718</b>	£730	£567	<b>£1,297</b>	£595	£466	<b>£1,061</b>
2018	£650	£683	<b>£1,333</b>	£859	£662	<b>£1,522</b>	£701	£543	<b>£1,243</b>
2019	£688	£739	<b>£1,427</b>	£1,102	£843	<b>£1,945</b>	£900	£690	<b>£1,590</b>
2020	£596	£613	<b>£1,209</b>	£938	£716	<b>£1,654</b>	£772	£590	<b>£1,362</b>
2021	£519	£542	<b>£1,061</b>	£800	£609	<b>£1,409</b>	£662	£505	<b>£1,167</b>
2022	£461	£492	<b>£953</b>	£694	£527	<b>£1,221</b>	£577	£438	<b>£1,015</b>
<b>TOTAL</b>	<b>£6,513</b>	<b>£6,622</b>	<b>£13,135</b>	<b>£7,773</b>	<b>£6,173</b>	<b>£13,946</b>	<b>£6,513</b>	<b>£5,223</b>	<b>£11,735</b>

Source: Europe Economics

- 1.25 ECO costs are not met out of central government funds but are recovered by energy companies from a surcharge on all domestic energy bills. The cost of support for LI and CWI under the ECO Plus scenario would add about £13 to the average household bill in 2013 on top of the SWI support already assumed under the government's Option 2. These additional costs would vary from year to year as the rate of installation changes. In some years this scenario would impose less cost than Option 2. Over 10 years the annual average addition to household energy bills under scenarios 1 and 2 would be in the range £3.50 to £4.50. The ECO Neutral scenario has the same ECO cost as DECC Option 2 over the ten year period although it is lower in some years and higher in others. The year by year costs relative to Option 2 are shown in Table 1.3



**Table 1.3: ECO costs relative to DECC Option 2 (£ million)**

Year	ECO Plus				ECO Neutral			
	LI	CWI	SWI	TOTAL	LI	CWI	SWI	TOTAL
2013	£115	£252	£-	£367	£115	£252	-£62	£304
2014	£103	£189	-£213	£79	£103	£189	-£289	3
2015	£92	£126	-£484	-£266	£92	£126	-£576	-£359
2016	£80	£63	-£420	-£277	£80	£63	-£532	-£389
2017	£69	£-	-£191	-£123	£69	£-	-£326	-£257
2018	£57	£-	£153	£210	£57	£-	£6	£51
2019	£46	£-	£369	£414	£46	£-	£166	£212
2020	£34	£-	£307	£342	£34	£-	£141	£175
2021	£23	£-	£258	£281	£23	£-	£120	£143
2022	£11	£-	£222	£233	£11	£-	£105	£116
<b>TOTAL</b>	<b>£630</b>	<b>£630</b>	<b>£0</b>	<b>£1,260</b>	<b>£630</b>	<b>£630</b>	<b>-£1260</b>	<b>£0</b>

Source: Europe Economics

- 1.26 At the 50 per cent rate assumed here the average subsidy per household benefiting from either LI or CWI under our scenarios would be £150 per LI and £250 per CWI. At the 57 per cent rate assumed for SWI the average subsidy per household benefiting from this measure would be £4,255. If both LI and CWI are installed at the same time there would be little in the way of additional cost savings and the ECO subsidy element would be £400, whilst if both LI and SWI are installed at the same time the average ECO subsidy element would be approximately £4,405.

### Houses treated

- 1.27 The number of homes that might benefit from LI and CWI under these scenarios is largely determined by the number of homes taking up LI. We have assumed that if CWI is also an option then LI and CWI will be installed at the same time. This may slightly underestimate the number of homes benefiting in so far as there are homes that have already taken full advantage of LI but can still benefit from CWI.
- 1.28 On the basis of our assumption, under our scenarios up to 1.6 million more homes could benefit from additional insulation between 2013 and 2022 than has been assumed by DECC. This is shown in Table 1.4 and illustrated in Figure 1.4.





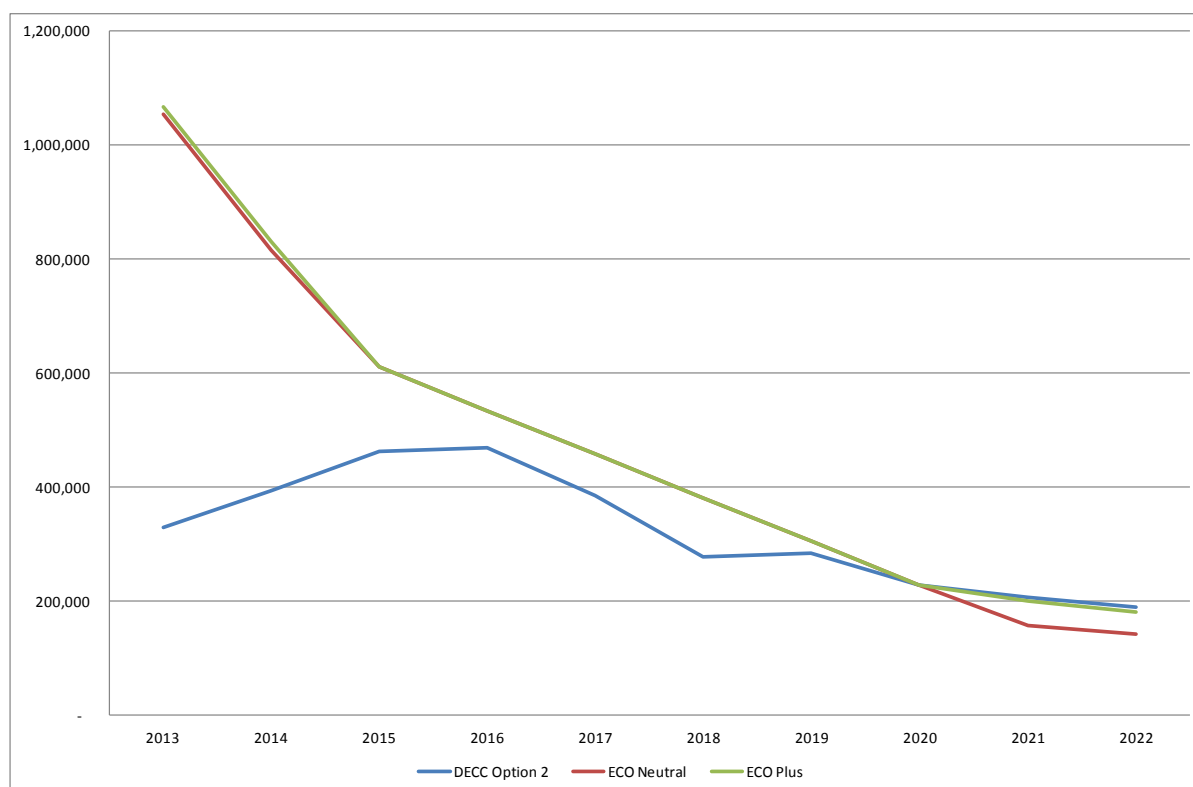
**Table 1.4: Number of houses treated under each of the options**

Year	DECC Option 2	LI/CWI – ECO Plus		LI/CWI – ECO Neutral	
		Number	Relative to DECC Option 2	Number	Relative to DECC Option 2
2013	328,321	1,068,000	739,679	1,055,050	726,729
2014	392,959	831,000	438,041	814,813	421,854
2015	463,419	610,909	147,490	610,909	147,490
2016	468,584	534,545	65,961	534,545	65,961
2017	385,949	458,182	72,232	458,182	72,232
2018	277,321	381,818	104,497	381,818	104,497
2019	283,186	305,455	22,268	305,455	22,268
2020	227,697	229,091	1,394	229,091	1,394
2021	205,740	199,534	-6,206	156,468	-49,272
2022	190,046	181,402	-8,644	142,250	-47,796
<b>TOTAL</b>	<b>3,223,222</b>	<b>4,799,936</b>	<b>1,576,714</b>	<b>4,688,580</b>	<b>1,465,358</b>

Source: Europe Economics

Note: It is assumed that installations will come in pairs in most cases – so if e.g. CWI is being installed the homeowner will generally choose to install LI at the same and vice versa. Therefore, the number of houses treated in each year is taken as whichever is greater out of the number of LI in that year, or the combined number of CWI and SWI in that year.

**Figure 1.4: Number of houses treated under each of the options**



Source: Europe Economics

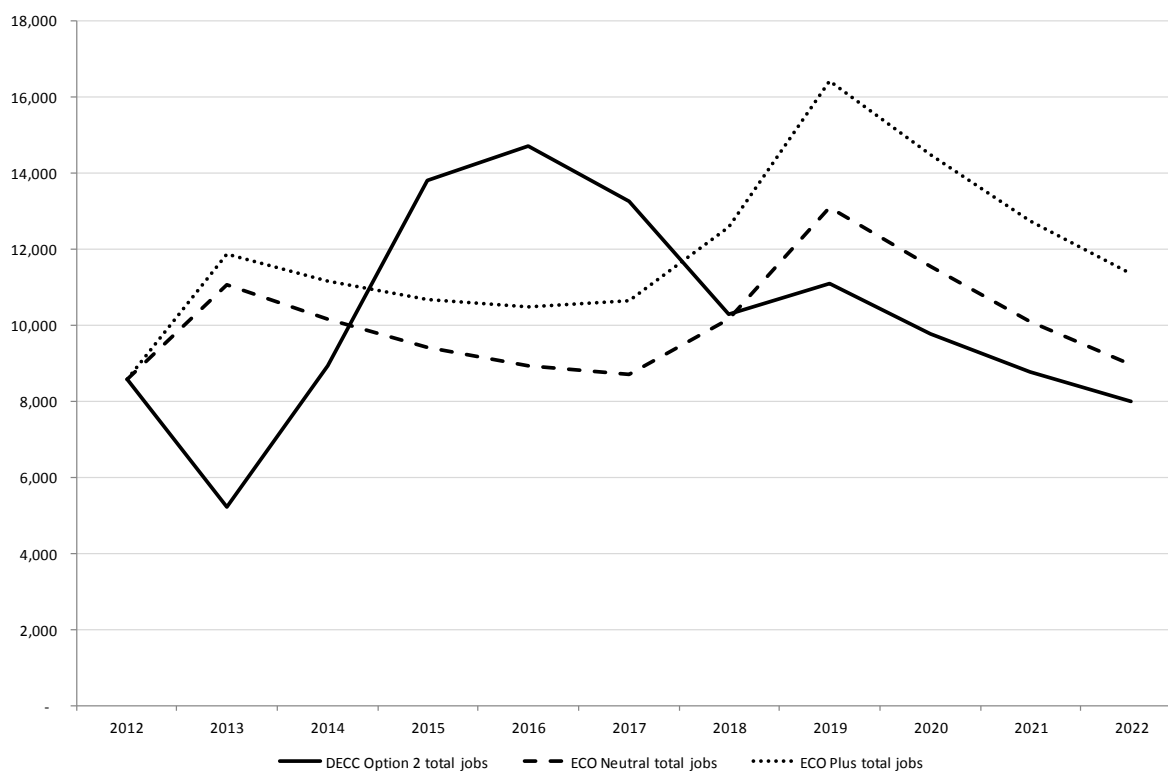


## Effect on employment

- 1.29 The Cavity Insulation Guarantee Agency (CIGA) estimate that there are currently 4,000 qualified installers of LI and CWI (1,500 LI fitters and 2,500 CWI technicians). We estimate that the annual rate of 10,000 SWI installations (prior to the introduction of the Green Deal) would require about 600 SWI installers, based on estimates of the time required to complete a SWI project:
- External Wall Insulation: 15 man days per project (80m<sup>2</sup> wall area) – usually three man team will take five working days
  - Internal Wall Insulation: 10 man days per project (80m<sup>2</sup> wall area) – usually two man team will take five working days
- 1.30 CIGA also assume that there are a further 4,000 jobs in LI and CWI related service jobs. Given the paucity of data, we have assumed that the service jobs related to SWI are included in this total.
- 1.31 We assume that the change in the number of insulation installations has a direct and proportional effect on the number of jobs in the industry. The change in employment (for LI, CWI, SWI and related service jobs) is estimated by multiplying the initial number of jobs (as outlined above) by the relative change in the number of installations.
- 1.32 Manufacturing of LI and CWI material is not as labour intensive as the installation process. There would be further job losses associated with reduced levels of production of insulation material but these have not been estimated here.
- 1.33 Under Option 2 there is projected to be a significant drop in LI and CWI and a large increase in SWI. This will result in an initial loss of around 3,000 jobs amongst LI and CWI installers in the first year followed by an increase in SWI employment which would more than offset the initial loss. However as noted above the industry considers that the rate of increase assumed for SWI is unrealistic and with a lower ramp up rate the growth in jobs would also be reduced. In addition it cannot be assumed that LI and CWI installers who lose employment move directly into SWI work. Different skills are involved and retraining would be required. Without adequate training provision and time for installers to complete that training, the transitional disruption is likely to be greater than is apparent from these numbers.
- 1.34 Under our scenarios employment of LI and CWI installers is maintained in the early years and is replaced by SWI employment in later years. The employment profile is smoother avoiding the troughs and peaks of DECC Option 2. This is shown in Figure 1.5. Over the ten year period the additional work on LI and CWI under the ECO Plus scenario could, on average, create an additional 1,800 jobs. Under the ECO Neutral scenario total employment over the period would be similar to DECC Option 2.



**Figure 1.5: Employment under ECO Plus, ECO Neutral and DECC Option 2**



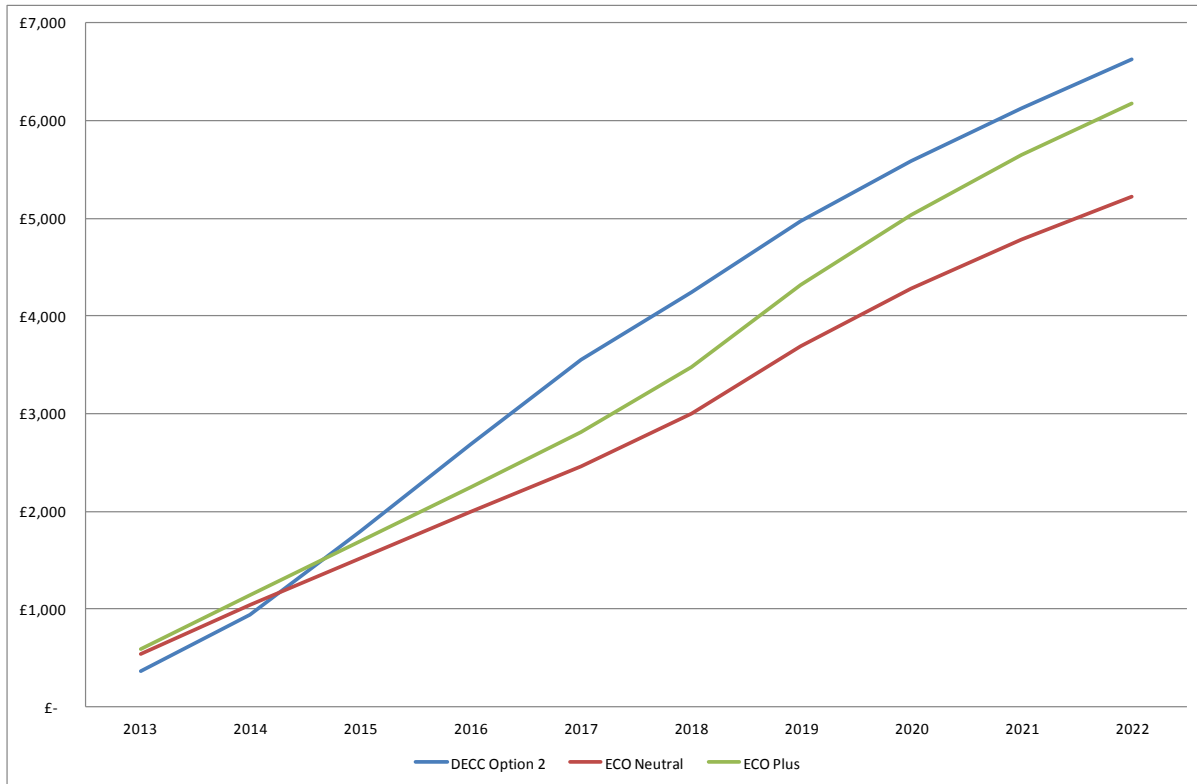
Source: Europe Economics

### Green deal finance

1.35 We have also compared the breakdown of expenditure between Green Deal financed and ECO support. The estimated value of Green Deal finance for insulation installations has been shown above in Table 1.2. The build-up of Green Deal finance under Option 2 and our Scenarios is illustrated in Figure 1.6. Under our scenarios Green Deal finance is higher in the first year of the scheme and in some later years but is lower over the life of the scheme as a whole. However, both the ECO Plus and ECO Neutral scenarios would promote activity in, respectively, around 1.6 and 1.5 million more homes than DECC Option 2. The industry considers that this is likely to generate the take-up of other measures in these homes, significantly increasing the quantity of Green Deal finance.



**Figure 1.6: Cumulative Green Deal finance (£m)**



Source: Europe Economics



## APPENDIX 1: ALTERNATIVE SCENARIOS

### Variants on ECO Plus scenario

A1.1 We have looked at three variants of the ECO Plus scenario to explore the impact on costs and benefits and the time profile of installations. These variants are:

- ECO Plus - lower CWI. Under this variant we took the lower level of CWI installations assumed by DECC but assumed these were all installed by 2017.
- ECO Plus - Reduced ECO subsidy. Installations rates unchanged but only 25 per cent of the costs of LI and CWI paid for through ECO, 57 per cent subsidy maintained for SWI. This option has only been used to evaluate the split between ECO and Green Deal Finance. The impact of changing the level of ECO support on take-up has not been modelled.
- ECO Plus - High industry delivery of SWI. Unchanged LI and CWI and SWI installations over ten years but with a different SWI installation schedule. 50 per cent ramp up initially compared to 25 per cent.

A1.2 The costs and benefits of these variants are summarised in Table A1. 1 in comparison with DECC Option 2 and ECO Plus. It is notable that reducing the ECO subsidy for LI and CWI from 50 per cent to 25 per cent only reduces the total ECO cost by about 10 per cent. Reduction in the number of CWI installations has an even smaller impact. This is because the cost of SWI work is the dominant element in total cost.

**Table A1. 1: Costs and benefits of alternative scenarios**

	DECC Option 2	ECO Plus	Lower CWI	Reduced ECO subsidy	High industry delivery of SWI
Net benefits (£ million)	£9,301	£15,284	£11,979	£15,284	£15,270
Net benefits relative to DECC Option 2 (£ million)	-	£5,983	£2,677	£5,983	£5,969
CO <sub>2</sub> savings (million tonnes)	90.2	117.0	102.5	117.0	117.2
CO <sub>2</sub> savings relative to DECC Option 2 (million tonnes)	-	26.7	12.2	26.7	27.0
£benefit/tonne CO <sub>2</sub> saved	£103	£131	£117	£131	£130
ECO costs (£million)	£6,513	£7,773	£7,566	£7,143	£7,773
Year in which 1.95 MtCO <sub>2</sub> target reached	2020	2018	2019	2018	2017

Source: Europe Economics

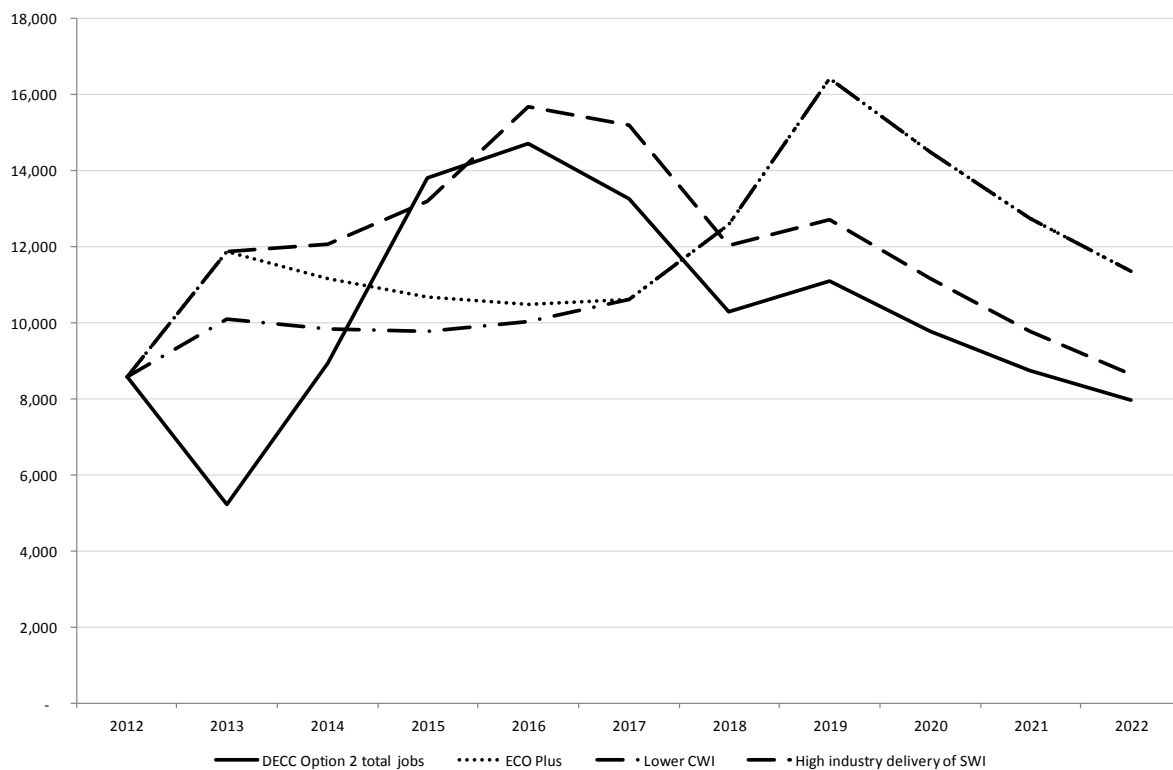
A1.3 The impact on employment is shown in Table A1. 2. As one would expect, a more rapid ramp up in delivery of SWI brings forward the employment associated with that work. A



lower level of CWI installations reduces the level of employment in the years up to 2017 (by which date CWI work is assumed to have been completed).

A1.4 Only the lower CWI variant has an impact on the number of houses treated although the time profile will vary in other variants. This falls by about 450,000 but still remains above the level under DECC Option 2.

**Table A1. 2: Employment**

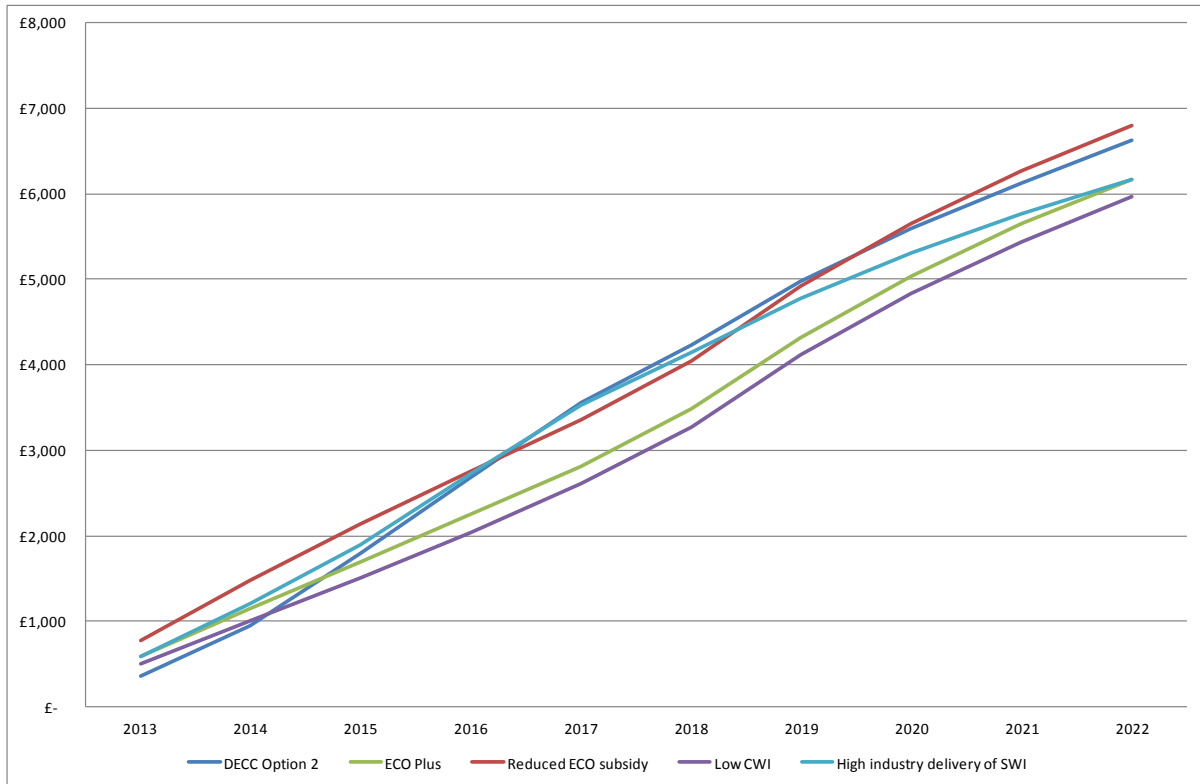


Source: Europe Economics

A1.5 The impact on ECO and Green Deal costs for each variant is summarised in Figure A1. 1. Reducing the ECO subsidy for LI and CWI has the effect (since we have assumed that there is no effect on take-up) of increasing the level of Green Deal funding pushing it above the DECC Option 2 level in a number of years.



**Figure A1. 1: Cumulative Green Deal finance (£m)**



Source: Europe Economics