

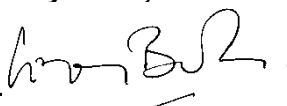
Title: Carbon Emissions Reduction Target – appliances and consumer electronics Lead department or agency: Department of Energy and Climate Change Other departments or agencies:	Impact Assessment (IA)
	IA No: DECC0038
	Date: 16/11/2010
	Stage: Consultation
	Source of intervention: Domestic
	Type of measure: Secondary legislation
Contact for enquiries: Nicholas.Taylor@decc.gsi.gov.uk Joseph.hamed@decc.gsi.gov.uk	

Summary: Intervention and Options

What is the problem under consideration? Why is government intervention necessary? <p>CERT aims to overcome barriers preventing consumers from accessing and securing energy efficiency measures - including a lack of information, energy prices which do not reflect the negative impact of emissions, limited time horizons and access to credit. The issue considered here is whether CERT support for consumer electronics and appliances presents greater risks to the objectives of the programme than insulation or heating measures. In terms of deadweight these products are incentivised through labelling schemes; in terms of statutory carbon budgets they are already covered by the carbon price through EU ETS which caps emissions; and, in being promoted via retail outlets, or direct mail, allow for less assurance on installation and use.</p>	
What are the policy objectives and the intended effects? <p>The policy aims to drive an increase in cost effective and long lived energy efficiency measures such as insulation, so as to maximise their contribution to both environmental targets (reducing carbon emissions) and social targets (helping alleviate fuel poverty). The policy aims to do this in an equitable way and sets suppliers subtargets for delivering a proportion of their target to lower income, more vulnerable groups. Removal of consumer electronics and appliances would enable CERT to focus on cost effective insulation and heating measures, reducing the risk that reported carbon savings are not realised owing to deadweight and increasing confidence in the scheme's contribution to statutory carbon budgets (by increasing the proportion of savings generated outside of the EU ETS).</p>	
What policy options have been considered? Please justify preferred option (further details in Evidence Base) <p>The consultation asks for evidence which will allow us to consider the following options:</p> <ol style="list-style-type: none"> Option 1, "do nothing" would be to retain the existing status quo – that is, for appliances and consumer electronics to remain eligible as now, within existing CERT extension rules governed by the CERT amendment SI 2010 (page 2); this option has been presented with positive costs and benefits to reflect the position of the CERT extension IA. Option 2, all appliances and consumer electronics are excluded from CERT. This option reflects the extreme outcome of the consultation whereby all such products would be excluded altogether from CERT. Less extreme scenarios, such as reducing the credits awarded for such measures, would likely lead to costs and benefits somewhere in between the two options presented in this analysis. These scenarios have not been modelled here. 	
When will the policy be reviewed to establish its impact and the extent to which the policy objectives have been achieved?	It will be reviewed 05/2013
Are there arrangements in place that will allow a systematic collection of monitoring information for future policy review?	Yes

Ministerial Sign-off For consultation stage Impact Assessments:

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister:  Date: 16 November 2010.....

Summary: Analysis and Evidence

Policy Option 1

Description:

OPTION 1: Central CERT Extension Impact Assessment but with a 24 month rather than 21 month delivery period

Price Base Year 2010	PV Base Year 2010	Time Period Years 42	Net Benefit (Present Value (PV)) (£m)		
			Low: -	High: -	Best Estimate: 9,930

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	-	2	0	-
High	-		0	-
Best Estimate	4,274		0	4,274

Description and scale of key monetised costs by 'main affected groups'

Supplier installation costs: £1,788m (PV)
 The supplier installation costs are the total estimated costs to business of the policy
 Other installation costs (householders / owners / accomodation providers): £1,364m (PV)
 Hidden costs such as time costs to householders / owners: £1,122m (PV)

Other key non-monetised costs by 'main affected groups'

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0	2	409	8,971
High	0		935	20,520
Best Estimate	0		647	14,205

Description and scale of key monetised benefits by 'main affected groups'

Change in energy use: £6,811(PV)
 Change in air quality: £982(PV)
 Increase in comfort: £3,278(PV)
 Avoided non-traded sector emissions: £2950(PV)
 Avoided purchase of EU ETS emissions allowances: £183(PV)

Other key non-monetised benefits by 'main affected groups'

Expected health benefits to those who are fuel poor and receive a measure.
 Increased energy security.
 Job security and economic growth and innovation in energy efficiency industry.

Key assumptions/sensitivities/risks

Discount rate (%) 3.5

It is assumed in calculating the benefits that appliances and consumer electronics are additional (would not have otherwise been installed) and replace energy inefficient predecessors, are fully utilised, and are effectively installed. This assumption is tested for the products under consideration for removal from CERT. Estimates are based on a cost-minimisation prediction of supplier behaviour. Estimates are rounded to the nearest £m to help compare figures rather than as a reflection of accuracy. Estimates are sensitive to the distribution of additional measures by the type of fuel used in recipient homes, this has been tested in the case of Solid Wall Insulation. Benefits are valued using projections of future energy and carbon prices as well as projections of energy grid decarbonisation. The estimates are sensitive to these prices.

Impact on admin burden (AB) (£m):		Impact on policy cost savings (£m):		In scope
New AB:	AB savings: 0	Net:	Policy cost savings:	No

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?		Great Britain			
From what date will the policy be implemented?		01/04/2011			
Which organisation(s) will enforce the policy?		Ofgem			
What is the annual change in enforcement cost (£m)?		£1.7m			
Does enforcement comply with Hampton principles?		Yes			
Does implementation go beyond minimum EU requirements?		Yes			
What is the CO ₂ equivalent change in greenhouse gas emissions? (Million tonnes CO ₂ equivalent)		Traded: -9		Non-traded: -66	
Does the proposal have an impact on competition?		No			
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?		Costs: 0		Benefits: 0	
Annual cost (£m) per organisation (excl. Transition) (Constant Price)	Micro	< 20	Small	Medium	Large
Are any of these organisations exempt?	Yes	Yes	Yes	No	No

This analysis is fully set out in the 30th June published Impact Assessment

Summary: Analysis and Evidence

Policy Option 2

Description:

OPTION 2: Consulation Scenario - as above but with consumer electronics, appliances, RTDs and LED lighting excluded from the mix of eligible measures to be promoted

Price Base Year 2010	PV Base Year 2010	Time Period Years 42	Net Benefit (Present Value (PV)) (£m)		
			Low: -	High: -	Best Estimate: 9,639

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	-	0	-
High	-	0	-
Best Estimate	4,522	0	4,522

Description and scale of key monetised costs by 'main affected groups'

Supplier installation costs: £1,880m (PV)
 The supplier installation costs are the total estimated costs to business of the policy.
 Other installation costs (householders / owners / accomodation providers): £1,464m (PV)
 Hidden costs such as time costs to householders / owners: £1,179m (PV)

Other key non-monetised costs by 'main affected groups'

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0	407	8,936
High	0	932	20,445
Best Estimate	0	646	14,161

Description and scale of key monetised benefits by 'main affected groups'

Change in energy use: £6,670(PV)
 Change in air quality: £988(PV)
 Increase in comfort: £3,328(PV)
 Avoided non-traded sector emissions: £3,018(PV)
 Avoided purchase of EU ETS emissions allowances: £153(PV)

Other key non-monetised benefits by 'main affected groups'

Expected health benefits to those who are fuel poor and receive a measure.
 Increased energy security. Promotion of measures that are currently underdeveloped markets, such as solid wall insulation and heat pumps, may lead to innovation and economies of scale potentially leading to lower costs in the future. Some high-cost measures are targeted at priority groups focussing benefits of innovative technology on those who most need them.

Key assumptions/sensitivities/risks

Discount rate (%) 3.5

Estimates are based on a cost-minimisation prediction of supplier behaviour. Estimates are rounded to the nearest £m to help compare figures rather than as a reflection of the accuracy of prediction.
 Cost estimates are based on DECC research as actual costs are commercially secret.
 Benefits are valued using projections of future energy and carbon prices as well as projections of energy grid decarbonisation. The estimates are sensitive to these prices. Estimates of benefits are sensitive to the assumptions about the distribution of measures over the types of heating in recipient homes. These sensitivities have been examined in the case of solid wall insulation.

Impact on admin burden (AB) (£m):		Impact on policy cost savings (£m):		In scope
New AB:	AB savings:	Net:	Policy cost savings:	Yes/No

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?	Great Britain				
From what date will the policy be implemented?	01/04/2011				
Which organisation(s) will enforce the policy?	Ofgem				
What is the annual change in enforcement cost (£m)?	£1.7m				
Does enforcement comply with Hampton principles?	Yes				
Does implementation go beyond minimum EU requirements?	Yes				
What is the CO ₂ equivalent change in greenhouse gas emissions? (Million tonnes CO ₂ equivalent)	Traded: -7		Non-traded: -68		
Does the proposal have an impact on competition?	No				
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?	Costs: 0		Benefits: 0		
Annual cost (£m) per organisation (excl. Transition) (Constant Price)	Micro	< 20	Small	Medium	Large
Are any of these organisations exempt?	Yes	Yes	Yes	No	No

Specific Impact Tests: Checklist

Set out in the table below where information on any SITs undertaken as part of the analysis of the policy options can be found in the evidence base. For guidance on how to complete each test, double-click on the link for the guidance provided by the relevant department.

Please note this checklist is not intended to list each and every statutory consideration that departments should take into account when deciding which policy option to follow. It is the responsibility of departments to make sure that their duties are complied with.

Does your policy option/proposal have an impact on...?	Impact	Page ref within IA
Statutory equality duties ¹ Statutory Equality Duties Impact Test guidance	No	18
Economic impacts		
Competition Competition Assessment Impact Test guidance	No	17
Small firms Small Firms Impact Test guidance	No	17
Environmental impacts		
Greenhouse gas assessment Greenhouse Gas Assessment Impact Test guidance	Yes	18
Wider environmental issues Wider Environmental Issues Impact Test guidance	Yes	18
Social impacts		
Health and well-being Health and Well-being Impact Test guidance	Yes	18
Human rights Human Rights Impact Test guidance	No	18
Justice system Justice Impact Test guidance	No	18
Rural proofing Rural Proofing Impact Test guidance	No	18
Sustainable development Sustainable Development Impact Test guidance	Yes	18

A brief assessment of how a decision to exclude appliances and consumer electronics would impact each of these tests, set against the full analysis provided in the CERT extension Impact Assessment, is set out on pages 14-16.

¹ Race, disability and gender Impact assessments are statutory requirements for relevant policies. Equality statutory requirements will be expanded 2011, once the Equality Bill comes into force. Statutory equality duties part of the Equality Bill apply to GB only. The Toolkit provides advice on statutory equality duties for public authorities with a remit in Northern Ireland.

Evidence Base (for summary sheets) – Notes

Use this space to set out the relevant references, evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Please fill in **References** section.

References

Include the links to relevant legislation and publications, such as public impact assessment of earlier stages (e.g. Consultation, Final, Enactment).

No.	Legislation or publication
1	<u>Extending the Carbon Emissions Reduction Target consultation and impact assessment</u> http://www.decc.gov.uk/en/content/cms/consultations/cert_ext/cert_ext.aspx
2	
3	
4	

+ Add another row

Evidence Base

Annual profile of monetised costs and benefits (transition and recurring)

Annual profile costs and benefits - (£m) constant prices

	Y ₀	Y ₁	Y ₂	Y ₃	Y ₄	Y ₅	Y ₆	Y ₇	Y ₈	Y ₉	Y ₁₀	Y ₁₁	Y ₁₂	Y ₁₃
OPTION 1														
Transition costs	1,933	2,578												
Annual recurring cost														
Total annual costs	1,933	2,578												
Transition benefits														
Annual recurring benefits		60	143	149	151	152	155	158	160	165	162	164	166	168
Total annual benefits		60	143	149	151	152	155	158	160	165	162	164	166	168
OPTION 2														
Transition costs	2045	2727												
Annual recurring cost														
Total annual costs														
Transition benefits														
Annual recurring benefits		58	140	147	148	149	152	155	157	162	159	161	163	165
Total annual benefits		58	140	147	148	149	152	155	157	162	159	161	163	165

Y ₁₄	Y ₁₅	Y ₁₆	Y ₁₇	Y ₁₈	Y ₁₉	Y ₂₀	Y ₂₁	Y ₂₂	Y ₂₃	Y ₂₄	Y ₂₅	Y ₂₆	Y ₂₇
174	178	180	182	184	185	185	180	173	173	173	173	173	173
174	178	180	182	184	185	185	180	173	173	173	173	173	173
170	174	177	179	180	182	182	177	171	171	171	171	171	171
170	174	177	179	180	182	182	177	171	171	171	171	171	171

Y ₂₈	Y ₂₉	Y ₃₀	Y ₃₁	Y ₃₂	Y ₃₃	Y ₃₄	Y ₃₅	Y ₃₆	Y ₃₇	Y ₃₈	Y ₃₉	Y ₄₀	Y ₄₁
173	173	173	164	152	152	152	152	152	152	152	152	152	87
173	173	173	164	152	152	152	152	152	152	152	152	152	87
171	171	171	163	152	152	152	152	152	152	152	152	152	87
171	171	171	163	152	152	152	152	152	152	152	152	152	87

Evidence Base (for summary sheets)

A. Overview

1. CERT sets electricity and gas suppliers a household carbon emissions reduction target which they must meet by promoting measures to domestic energy consumers which improve energy efficiency, reduce energy demand or increase microgeneration. A full impact assessment of the CERT extension scheme was completed and published on 30th June 2010 alongside the Government decisions document which announced a commitment to extend CERT to December 2012 (from March 2011) and to introduce further obligations on suppliers which act to increase the distributional equity of the scheme and the proportion of insulation delivered.
2. This impact assessment does not look to replicate this full analysis. Rather this work sits alongside and appends the original Impact Assessment². It assesses the impact of removing all consumer electronics and appliances as eligible from being promoted over the extension period from April 2011 – December 2012 and accompanies a consultation which seeks evidence on the role of these products under the scheme. This meets a commitment in the CERT extension decisions document to undertake this analysis and builds on an analysis of the previous phase of the supplier obligation the second phase of the Energy Efficiency Commitment (EEC2 – see **Annex 7**).
3. It is clear that an optimised CERT scheme is one which promotes energy saving measures consumers want and need support in taking up, and where there is some assurance they will be installed and replace less efficient alternatives, saving the awarded lifetime carbon saving score. Ultimately it is a scheme which needs to maximise its contribution to statutory carbon saving budgets. This impact assessment considers these issues further in the context of appliances and consumer electronics in the scheme and should be seen alongside the consultation narrative on this.
4. Appliances, consumer electronics, real time displays (RTDs) and light emitting diode lighting (LEDs) constitute a projected 3.1% or rather 3.26 MtCO₂ of the extension target of 108 lifetime Million tonnes of carbon dioxide as presented in the original CERT extension Impact Assessment.

B. Problem under consideration

5. The problem to be addressed specifically is the issue of deadweight in realising the benefits of CERT. Measures that count towards the target may go underused, or they may not have replaced significantly less energy inefficient products, or the market may have evolved to the point that consumers would have purchased and used energy saving products in the absence of CERT. All of these factors reduce the realised benefits from CERT.
6. This Impact Assessment considers the option to remove consumer electronics and appliances from the CERT extension scheme. This is in addition to the removal of Compact Fluorescent Light bulbs (CFLs) that was legislated for as part of the CERT extension and considered as part of the CERT extension impact assessment.

C. Rationale and policy objective

7. A range of barriers have historically led to a degree of underinvestment in measures that improve domestic energy efficiency, in particular, information deficiencies, inadequate price signals³, and limited access to capital.
8. CERT represents one of a suite of mechanisms for circumventing some of those barriers, in order to deliver improvements in household energy efficiency and contribute to a reduction in carbon emissions.
9. In considering and deciding on the policy framework for the CERT extension it was recognised that a number of important developments had occurred since the outset of the CERT scheme in 2008 (e.g. given delivery mix, market penetration of products etc).
10. This led to several actions as part of the July 2010 amendment Order bringing into force the CERT extension period to December 2012, including:

² Extending the Carbon Emissions Reduction Target consultation and impact assessment
http://www.decc.gov.uk/en/content/cms/consultations/cert_ext/cert_ext.aspx

³ E.g. the price of non-traded carbon is not included in energy prices.

- A new professional insulation minimum of 73.4 MtCO₂ over the period to end 2012
- From April 2011, only allowing products to be promoted under the market transformation ring fence (and so eligible for a 50% increase in carbon score) if they had not featured before CERT rather than before EEC2;
- From April 2011, an increased EU rating required for certain appliances (i.e. A to A* for fridges);
- Compact fluorescent lamps (and halogens) were completely removed as eligible from April 2011.

11. Notably on CFLs, it was considered that:

- CERT had already transformed the market, to the point that provision of more CFLs through the scheme could not be guaranteed to deliver additional carbon emissions savings; it was becoming difficult to be sure that CFLs would actually deliver savings as they might not all be used and might not be additional to the numbers of CFLs that would have been bought in the absence of CERT;
- An EU Directive is phasing out less efficient incandescent alternatives which is to be mostly delivered by September 2011;
- Reductions in emissions delivered through CFLs are entirely due to emissions that are traded in the EU emissions trading scheme.

12. In short some of the barriers that had slowed take up of CFLs have been overcome, partly as a consequence of previous supplier obligations. This meant that their ongoing inclusion might, despite their cost-effectiveness, not in fact lead to reductions in carbon emissions beyond business as usual.

13. Ultimately, CERT will deliver a greater proportion of its target carbon savings if⁴:

- any measure promoted is properly installed, replaces a less efficient alternative and is effectively utilised over its life;
- it is unlikely that the measure would be installed (or installed after a long period of time) in the absence of CERT; and
- it delivers energy savings in the non-traded sector.

14. Barriers to the natural uptake of efficient measures will tend to be greatest for long lasting, one off investments that have large upfront costs. Many appliances and consumer electronics will tend to be repeat purchases, and have relatively short lifetimes compared to insulation measures. In addition all electronics and appliances deliver savings through the EU emissions trading scheme (ETS) rather than direct non-traded carbon savings. Table 1 summarises these characteristics for some selected measures. By removing or restricting eligibility for these products, the scheme will focus on products which contribute to statutory carbon budgets, although products may provide a cost effective way of meeting the EU ETS cap.

Table 1: Examples of product life, retail price, and proportion of savings that are traded

Measure	Lifetime (Yrs) ¹	Estimated Installation cost (£) ²	Estimated hidden costs to household (£) ³	Proportion (%) of emissions savings expected to be in non-traded sector ⁴
Cavity wall insulation	40	466	100	94
Loft top up	40	355	165	94
CFL	8	4		0
LED	19.5	10		0
A++ cold appliance	10	62		0

¹ CERT extension IA Annex D

² CERT extension IA Annex D – total costs for non-priority group including admin except CFLs taken from CERT IA

³ CERT extension IA Annex H – hidden costs for private owners

⁴-Ignores offsetting changes in usage of other fuels, and comfort taking.

⁴ How far suppliers use the various carbon uplift incentives at their disposal for more innovative products is also a factor

15. It is difficult to estimate the expected deadweight associated with each consumer product and appliance, given the fact that they are typically newer products with little information on how they will be taken up. There are a larger number of drivers for more efficient consumer electronics than for insulation. It is harder therefore to disentangle market transformation and the effect of, for instance, the range of labelling schemes which already act to help overcome information barriers in encouraging the uptake of more efficient products. **Annex 7** presents some evidence from earlier supplier obligations about the market penetration achieved in some consumer appliances markets.
16. Taken together, the European Products Directive, Energy Star and EUP labelling (see **Annex 5**) are expected to have an effect in reducing barriers to uptake - across the EU it is assumed that more than half of the projected appliance savings by 2010, some 35 TWh (3 MtCO₂e), is due to labelling.⁵ Hence it is reasonable to assume that there is some deadweight among products covered by such measures, and therefore the headline benefits of Option 1 may be overestimated to some extent. The assumption used in the headline analysis is that consumer electronics and appliances are all installed, used and that they replace energy inefficient products⁶.
17. The associated consultation asks whether CERT should focus on those products where we can establish a high degree of certainty that the measure is properly installed, and likely to delivering the awarded carbon savings.

D. Options considered

18. Two extreme options are presented in this Impact Assessment to reflect the exclusion of a range of products discussed on the consultation (See Annex 4 for further details). Depending on the outcome of the consultation the final option will lie in between options 1 and 2 depending on whether each individual product is included, excluded, or otherwise restricted⁷.
19. **OPTION 1: Do nothing:** This option and its costs and benefits are discussed in the CERT extension impact assessment, with the exception of one updated assumption, discussed below; that suppliers are assumed to have an additional 3 months to deliver measures. The promotion of consumer electronics and appliances would remain eligible as now. Certain restrictions on how far these measures are promoted over the extension period already exist:
 - a. CFLs and halogens have already been excluded from the extension mix;
 - b. a requirement that 68% of the extension target is met through professionally installed insulation measures has been imposed;
 - c. a requirement that any such product being promoted by direct mail, and where free through retail promotions, only be distributed following a specific consumer request;
20. **OPTION 2 :Consumer electronics and appliances removed from CERT:** The alternative option is that all other consumer electronics and appliances, RTDs and Light Emitting Diode (LED) lighting are excluded. Suppliers are assumed to change the mix of measures that they pursue and deliver target savings using other measures.
21. This presents the extreme possible outcome of this consultation – that is that no consumer electronic, or appliance, LED or RTD are found to merit ongoing inclusion in the scheme.

E. Costs and benefits

22. The costs and benefits of each option are estimated according to the framework set out in the CERT extension impact assessment. The major costs are those of installing the measures (borne by suppliers and recipients); hidden costs (borne by recipients); and running costs that are incorporated into suppliers installation costs. The major benefits of the scheme are, reduced energy consumption; increased comfort; reduced purchase of EU ETS allowances; reduction of carbon emissions in the non-traded sector; and improved air quality. The estimates of these costs and benefits for the two options considered here are presented below

⁵ Impact Assessment Report for the Action Plan for Energy Efficiency 2006: http://ec.europa.eu/energy/action_plan_energy_efficiency/index_en.htm

⁶ Although some compensating changes in the use of other fuels is assumed.

⁷ Restrictions might include, a limit on the percentage of the carbon saving target that such measures can achieve, or an amendment to the carbon score given to the measure

Assumptions

Further narrative and information on the assumptions alongside the revised illustrative mixes are presented in Annex 2.

23. Only one assumption has been changed from the CERT extension IA presented in the summer; the delivery period has been extended to 24 months (January 2011 – December 2012) from 21 months (April 2011 – December 2012) to take account of the Regulations coming into force early. This has the following effect.

OPTION 1: Central Scenario – 24 months delivery

24. As in the CERT extension IA an indicative mix of installations has been calculated adjusting the time period to reflect the additional 3 months mentioned above. This gives a suggestion about what types of measures suppliers might prefer given the flexibility they have in delivering the target savings.
25. The revised indicative mix suggests that an additional 200,000 wall cavities may be installed in this additional period. This is plausible given the assumptions set out at **Annex 2**. At the same time solar water heaters drop out of the mix and the percentage of appliances forming part of the mix also falls – specifically the number of cold appliances. Tables detailing the indicative mixes that underlie these calculations can be found in the annex.
26. In total, the percentage contribution of appliances and consumer electronics falls (displaced by more cost effective insulation measures) so that in the baseline scenario they constitute 2.3% of rather 2.4 MtCO₂ of the 108 MtCO₂ extension target.
27. It is worth noting at this point that the whole target is not assumed to be delivered and valued in actual emissions savings. This is to take account of possible overlap with other policies, and in particular the various innovation carbon uplifts which are available e.g. Up to 5% of the target can be awarded in uplifts under the market transformation ring fence for more innovative products like solid wall insulation.
28. Estimated supplier costs in the (now enforced) CERT extension scenario presented in the July IA, were £2.3bn. By lengthening the timescale, these costs fall to £1.8bn, a fall of £500mn. This equates to a fall of around 23% in annual supplier average cost pass through per household⁸ from £53 to £41. The tables below show the constraints used when estimating the indicative mix of measures, and the resultant costs.
29. In terms of *benefits*, the increase in cavity wall insulation installations increases in non-traded sector emissions savings of 2 million lifetime tonnes of CO₂
30. However, these energy savings are based on an assumption of 100% utilisation of the potential of the applications and full additionality of measures – that is there is no deadweight. If it is the case that some of the products included would not be used, or; that they would have been purchased anyway, then the energy savings in OPTION 1 would be an overestimate. Establishing the extent of the problem of additionality and under-utilisation of some of the measures is the purpose of the consultation. In principle all products for which there is no convincing evidence that their savings have not been overestimated will be considered for removal. To assess the impact of this deadweight the installation costs⁹ and benefits of consumer electronics and appliances can be removed from the costs and benefits of option 1 to reflect an extreme scenario of 100% deadweight¹⁰.

⁸ This pass through cost (supplier cost per household per year) is an estimate of the impact on the average annual energy bills (without accounting for energy savings or changes in behaviour) if costs were entirely passed from suppliers to consumers energy prices. A proportionate fall in the impact on consumer energy bills is also expected to be seen on the £60 peak annual cost assumed in the CERT extension IA.

⁹ Administrative costs are assumed to be additional.

¹⁰ Both costs and benefits of measures are excluded as costs incurred to install measures in the absence of the policy are not freed up for use in production of other goods and services.

OPTION 2: Central Scenario minus consumer electronics, appliances & LEDs

31. In *cost* terms, the complete exclusion of all consumer electronics and appliances, increases total costs by £248 million, taking estimated supplier costs to £2bn. Supplier pass through costs per household per year increase by £2 to £43 from £41.
32. In terms of *benefits*, the increase in insulation installations increases non-traded sector emissions savings by 2 million lifetime tonnes of CO₂.
33. The net effect of removal of products is such that the NPV of OPTION 2 is lower than that of OPTION1, by £291m (see Table 2). The reasons for this are the possible overestimate of benefits of OPTION1 owing to deadweight, and the replacement of relatively cheap consumer electronics with high cost installations such as solid wall insulation. These issues are discussed in turn below.

Table 2: Impact on Costs and benefits of removing all appliances and consumer electronics

	CERT extension IA	OPTION 1 CERT ex - 24 months	OPTION 2 CERT ex - 24 months, products removed	Difference with removal of products
Costs (£m)				
Suppliers costs	2,308	1,788	1,880	92
Other installation costs	1,614	1,364	1,464	100
Hidden Costs	1,581	1,122	1,179	57
Total costs	5,504	4,274	4,522	248
<i>Supplier cost per year per household</i>	53	41	43	2
Benefits (£m)				0
Energy Savings	6,916	6,811	6,670	-141
Non-traded emissions avoided	2,869	2,950	3,018	68
Avoided traded emissions rights	202	183	158	-25
Air quality improvements	989	982	988	6
Comfort	3,175	3,278	3,328	50
Total Benefits	14,150	14,205	14,161	-44
<i>Non-traded emissions (MtCO₂e)</i>	-64	-66	-68	-2
NPV (£m)	8,647	9,930	9,639	-291

34. To consider the effect of deadweight on the relative costs and benefits of OPTION 1, table 3 presents adjusted estimates of the extreme case where all consumer electronics and appliances are deadweight. The costs, benefits and NPV of OPTION 1 all decrease after assuming that all appliances and consumer electronics are deadweight. The result is that options 1 and 2 are closer in NPV terms although the high cost measures in OPTION 2 mean that the NPV remains £77m below that of the adjusted OPTION 1.
35. This deadweight that may exist in OPTION 1 also implies a transfer of net benefit from suppliers (or all bill payers) to those who receive subsidised appliances. This transfer would be regressive if the recipients of “deadweight” appliances tended to be relatively well off, and progressive if the reverse were true. Since it is difficult to fully map deadweight for all of the products considered it is not possible to quantify this redistribution.

Table 3: Impact on costs and benefits of assuming all appliances and consumer electronics in option 1 are deadweight

	OPTION 1 CERT ex - 24 months	OPTION 1 CERT ex - 24 months with 100% deadweight for appliances	OPTION 2 CERT ex - 24 months, products removed	Difference with removal of products
Costs (£m)				
Suppliers costs	1,788	1,731	1,880	149
Other installation costs	1,364	1,320	1,464	144
Hidden Costs	1,122	1,122	1,179	57
Total costs	4,274	4,173	4,522	349
Benefits (£m)				
Energy Savings	6,811	6,519	6,670	151
Non-traded emissions avoided	2,950	2,959	3,018	59
Avoided traded emissions rights	183	155	158	3
Air quality improvements	982	979	988	9
Comfort	3,278	3,278	3,328	50
Total Benefits	14,205	13,890	14,161	271
<i>Non-traded emissions (MtCO₂e)</i>	-66	-66	-68	-2
NPV (£m)	9,930	9,716	9,639	-77

36. In table 3, above, the NPV of OPTION 2 is lower than that of OPTION1 even with the extreme assumption that all electronics and appliances are deadweight. The other factor underlying the relatively low NPV of OPTION 2 is the inclusion in the illustrative mix of high cost measures such as solid wall insulation (SWI). The NPV of SWI is negative if it is assumed, as in this IA, that (i) installation costs are high (owing to the early stage of market development); (ii) innovation benefits (future cost reductions) associated with increasing the take-up of SWI are not quantified; and (iii) installations are evenly distributed across the housing stock. This latter assumption does not account of a detail of the CERT scoring system that rewards suppliers for installing solid wall insulation in homes that are primarily heated by electricity or coal, rather than gas¹¹. As such it is likely that the benefits of SWI installations are underestimated. Sensitivity analysis shown in table 4 below shows that assuming more SWI installations are in homes heated by electricity increases the NPV of the illustrative mix associated with option 2¹² to slightly higher than that of OPTION 1 adjusted for deadweight.
37. Other high cost measures such as heat pumps that enter the revised illustrative mix also reduce the NPV of OPTION 2. However, these measures are concentrated entirely on the priority group and so are targeted on those who most need support. In addition, renewable measures contribute to the UK's legally binding renewable energy commitment for 2020 and towards the 12% ambition for renewable heat in particular. By helping to foster a market for such innovative technologies

¹¹The expected value of energy savings from SWI in homes heated by electricity are considerably greater than for those heated by gas, leading to a positive NPV for those homes due to the differences in energy prices. It is expected that expansion of the market, partly prompted by CERT, will lead to technical innovation and economies of scale that will lower costs in the future and make SWI attractive in homes heated by gas.

¹²This detail of OFGEMs scoring system is not reflected in the modelling of the illustrative mix of measures, so we have not incorporated these sensitivities into the main analysis. Sensitivity analysis was based on an unchanged illustrative mix of measures, but changing the distribution of SWI measures from 85% in gas and 6.6% in electrically heated homes, to 23% in gas and 66% in electrically heated homes.

additional benefits in terms of greater diversification of the fuel mix and reduction in costs due to learning from wider deployment could also be expected.

Table 4: Sensitivity of benefits to assumption about primary fuel in houses receiving Solid Wall Insulation

	OPTION1 no deadweight with revised SWI distribution	OPTION 1 100% deadweight and revised SWI distribution	OPTION 2 products removed and revised SWI distribution
Total costs (£m)	4,274	4,173	4,522
Energy Savings	7,486	7,194	7,430
Non-traded emissions avoided	2,863	2,872	2,920
Avoided traded emissions rights	273	245	260
Air quality improvements	1,111	1,107	1,132
Comfort	3,655	3,655	3,728
Total Benefits (£m)	15,389	15,074	15,471
NPV (£m)	11,115	10,901	10,949

Further benefits of OPTION 2

38. The scheme administrators, Ofgem, have a compliance regime in place which is based around technical monitoring on a proportion of installations, as well as consumer utilisation monitoring. This provides valuable data for those schemes which are professionally installed and enables tracking and follow up of installations. Many consumer electronic schemes are factory gate schemes and / or schemes promoted via retail outlets. The installation and utilisation of these measures is therefore at consumers own discretion. It is more difficult and costly to obtain statistically relevant assurance on the installation of appliances and consumer electronics, although for larger appliances with a high upfront cost such as televisions and refrigerators it is unlikely that they would go unused after purchase. By removing these measures, we can have greater assurance that the estimated economic benefits will be realised by society.
39. A further benefit of removing these products from CERT would be policy simplification – enabling Government to more easily project the impact of the scheme and then to evaluate its impact. It also helps Government more easily communicate to consumers the value for money the scheme provides in terms of the specific measures it supports, and the numbers of households benefiting. This is something that Government is able to track (via a voluntary agreement with suppliers on data reporting for professionally installed measures) but which has proved undeliverable for all measures promoted via retail routes.

F. Costs and benefits to business

40. Costs of £1,880 mn will fall to energy suppliers who can pass these onto consumers through their energy bills. This estimate has been revised downwards since the July impact assessment. The increase in costs to suppliers from excluding these products is £92 mn collectively over the course of the scheme.
41. Benefits accrue to those business who manufacture, supply and market measures supported by suppliers and taken up by consumers that would not otherwise have occurred without CERT support. We do not have specific figures on the level of these benefits, and so how these may change due to the impact of these changes. However in a report by Element Energy (published November 2008) 50,000 people were identified as being directly involved in energy efficiency products and services with a market size of £6,200 million. This does not include a large number of related jobs including gas fitters (120,000) electricians (240,000), appliance and associated retail

(430,000), window manufacture and installation (as opposed to glass manufacture – 120,000). It can thus be seen that alongside the 50,000 people directly involved with energy efficiency work there is a much larger number (~900,000) working in supporting areas. However, only a minor proportion of these supporting jobs are concerned with provision of energy efficiency products or services and therefore they are not included as dedicated energy efficiency jobs.

G. Administrative burden and policy savings

42. The option discussed here is not expected to change the administrative burden of CERT. Although it may increase the substantive costs of delivery to suppliers and recipients as set out in the table above. However, the updated assumption about delivery timetables has indicated that the costs to suppliers of the CERT extension are likely to be smaller than those originally estimated.

H. Summary

43. At the extreme, should evidence obtained through the products consultation that supports removing appliances and consumer electronics from CERT extension then CERT costs are likely to increase as the removed measures are cost effective options for suppliers to choose over and above more expensive insulation and heating measures. This IA has shown that the sensitivity of the net present value of the CERT extension to assumptions about deadweight and the delivery of the additional costly measures means that under some conditions removal of products may be socially beneficial. In addition, the scheme's contribution to non traded carbon savings and so carbon budgets, to levels of thermal comfort and so fuel poverty alleviation, are also expected to be boosted.
44. This would therefore represent an increased burden on business. However, the total level of burden is still expected to be significantly lower than that assumed for the CERT extension at the outset.

I. SPECIFIC IMPACT TESTS

45. The section below provides additional consideration only where a decision to no longer include appliances and consumer electronics in the scheme has a bearing. A full assessment of the CERT extension against each of these questions stands in the CERT extension IA.

Competition issues

46. The previous IA's consideration of whether policies have an impact on competition stands. The changes considered here would act to restrict how suppliers can operate in achievement to their targets. As noted, this could increase supplier costs of achieving their targets, including those for new entrants which cross, or expect to cross, the 50,000 customer threshold. At the same time, it would simplify the scheme, and the upfront costs which may be needed (on IT systems for example) which are needed by a supplier to manage their CERT scheme delivery. As electric efficiency products only constitute on average 3% of the projected supplier savings to the target, the impact on each obligated supplier in achieving their target is expected to be low – with market capacity for other energy saving measures able to fill the gap.
47. It is possible that small manufacturers of some products will be disadvantaged from losing out on the CERT subsidy, however it is also possible that there are some small suppliers who struggle to market their products on the large scale that Energy providers to, so removal of these products from CERT may benefit some smaller manufacturers of consumer electronics. Again the relatively small proportion that these products form of CERT means that there is no great departure from the overall impact considered in the CERT extension IA.

Small firms' impact

48. The consideration of appliances and consumer electronics has no bearing on the 50,000 customer threshold, which protects smaller energy suppliers. The previous impact assessment analysis of the impact on small businesses therefore stands.
49. One possible impact of restricting or excluding electricity efficiency products under CERT could be that smaller manufacturers or suppliers of these products which do not have a large market yet outside CERT face increased costs from no longer being able to access the subsidy currently available from CERT. This may slow the speed of their growth. How far these manufacturers are British based is unknown¹³. At the same time, those small retailers and manufacturers who may not

¹³ In the case of other measures, we know that 75% of the spend on insulation stays in the UK economy – see An assessment of the size of the UK household energy efficiency market, November 2008; Element Energy

have benefited from a partnership with an energy supplier could benefit from this subsidy being removed from, typically, larger firms.

Statutory Equality Duties

50. Policy screening of the CERT against Statutory Equality Duties on race, disability and gender which suggest the policy is robust presented previously, stand. It is believed that there is no potential for discrimination or adverse impact. Should decisions be taken to remove products, then there is expected to be a neutral (or positive) impact on equality objectives. For instance, a greater number of disabled and long term sick households targeted by the Super Priority Group could receive assistance (in terms of a significant energy saving measure from the eligible shortlist). However, those already in line to receive a significant energy saving measure, would no longer also receive a supplementary subsidised electricity efficiency measure (although they could have greater chance of receiving a secondary heating or insulation measure).

Social Impacts

51. The conclusions drawn on the CERT extension rating against the Health and Wellbeing, human rights and justice system stand. The only change from this approach would be that policy could be expected to increase its contribution to positive health and wellbeing benefits, notably from increasing the number of households likely to receive an insulation and heating measure, which can improve their levels of thermal comfort. This should increase the number of households expected to be helped out of fuel poverty. An assessment of the numbers impacted will be provided in the IA accompanying the final decisions document.

Rural Proofing

52. The conclusions drawn on rural proofing stand. A decision to withdraw consumer electronics and appliances from CERT, although removing those schemes which could promote electricity efficiency measures at scale, will increase the volume of insulation needing to be installed – including in those areas, such as rural populations, which have been less cost effective and so not as well targeted to date.

Sustainable Development

53. The consideration of the CERT Extension against overarching sustainable development principles stands as presented previously. The only changes from that analysis from any decisions to restrict or remove electricity efficiency measures would be, as noted above, to increase the contribution of the programme to statutory (non traded) carbon budgets, and to gas security of supply objectives, but to reduce its contribution to reducing electricity demand (previously at 1.61 TWh/year) and to slightly reduce the overall benefit to society (as the increase in social well being and thermal comfort is offset by increased cost of meeting the target). However, we can have more certainty that these (slightly reduced) economic benefits will be realised.
54. In terms of governance, such a simplification of the programme can be expected to increase administrative efficiency (and so reduce costs which could be passed onto consumers).

Annexes

ANNEX 1: Post Implementation Review (PIR) Plan

Please refer to the CERT extension Impact Assessment: An evaluation strategy is in place to provide a framework against which the effectiveness of the CERT scheme can be assessed. This includes quarterly data on the number and type of measures installed, increasing detail on where these are installed – with 6 monthly mapping reports, a project to assess real world impact on energy bills from those households receiving subsidised measures under the supplier obligation and a project to understand and consider the various delivery routes to market, how CERT is monitored and quality assured by suppliers; and in particular, to look at how CERT is perceived and taken up by customers. .

ANNEX 2: Assumptions

55. The cost benefit assessment included here follows that, and is consistent with, the CERT extension impact assessment (published 30th June).
56. One main assumption has been changed; the delivery period has been extended to 24 months (January 2011 – December 2012) from 21 months (April 2011 – December 2012). This is a reasonable adjustment, more reflective of expected delivery, for the following reasons:
- The CERT extension was agreed and brought into force on 1st August 2010, well ahead of the CERT extension phase. Suppliers were allowed to start work against their increased target with immediate effect. This additional time is something we could not have known or factored in ahead of bringing this into effect.
 - There is significant under utilisation of the existing insulation installation capacity. For example, in the last reported quarter to June 2009, 110,000 cavities were installed. Scaled annually this would mean a run rate of only 450,000, when the insulation industry have indicated a capability of 880,000.
 - Suppliers had achieved 85% of their original carbon saving target (185 MtCO₂ by March 2011) by June 2010. On current trajectories they will have largely met this target by December 2010. This means that suppliers will be able to use the full insulation capacity for the January – March 2011 period.
 - Suppliers have five months (August – December 2010) in which to establish extension target delivery plans, agree installer contracts and raise demand – including a winter period where demand tends to peak. This means that building three additional months for delivery is considered conservative but fair as an updated assumption.
 - The impact of this change is to reduce the estimated baseline cost of the CERT extension as suppliers are expected to be able to use the additional time to install more cost-effective measures.
57. The illustrative mixes which follow in Annex 4 are a tool which allows Government to develop a CERT framework which is ambitious but achievable. It is used to gauge the likely impact on a number of key variables, particularly overall costs and benefits. The data and assumptions underlying the draft illustrative mix have been built up through a range of industry and Government sources since 2002 and are routinely subject to consultation. They differ slightly from those used in the Green Deal impact assessment, as the Green Deal extends the lifetime for certain products such as solid wall insulation on the basis that the proposed new accreditation, training and product standard framework will increase confidence in the savings these products offer.
58. The mixes are based around an optimiser model to produce a mix of measures that suppliers might deliver. Full detail of the methodology and process used to determine the mixes are set out in **Annex D** of the CERT extension IA. It must be emphasised that the mixes are purely illustrative for analysis purposes and do not necessarily reflect the way in which suppliers might choose to deliver their target, nor is it intended to suggest particular targets or levels of activity that can be derived from any particular measure. It is important to note that neither illustrative mix presented here nor in the CERT extension IA include the full mix of possible consumer electronics available to suppliers to promote. In part this is due to modelling constraints, in part as it is difficult to project numbers of innovative /new technologies and in part due to the difficulties in effectively modelling for consumer electronics (where economies of scale, and commercial deals from international manufacturers cannot be easily accounted for).
59. Whilst only a small percentage of the target, the number of measures promoted is still high given the relatively small carbon saving that is achieved per measure (because for many appliance types the market has been transformed and EU legislation has implemented minimum standards).

ANNEX 3: Principles and Risks – pre-assessment

This table assesses how far the range of appliances and consumer electronics which have featured under CERT (typically but not exclusively through the market transformation route) are currently thought to rank against the risks to the programme.

Products	Risks		
	Deadweight (other market drivers exist)	Carbon budget (traded sector)	Uncertainty of installation ¹⁴
<u>Appliances</u>			
Domestic Cold Appliances (refrigerators, fridge-freezers, upright freezers and chest freezers);	X	X	
Domestic Laundry (washing machines, tumble driers and washer-driers);	X	X	
Dishwashers	X	X	
Microwave ovens with a low stand-by consumption	X	X	
Eco-Kettles	X	X	
<u>Consumer electronics</u>			
Integrated Digital Television – with digital receiver built in	X	X	
Integrated Video Recorder – DVD Recorder with digital receiver built in	X	X	
STB (energy efficient set-top box) and auto standby (auto standby software for Sky digital television set-top boxes)	X	X	
Integrated Video Recorder – DVD Recorder with digital receiver built in	X	X	
Home computers and peripherals & DAB radios	X	X	
Imaging equipment (energy efficient home printers)	X	X	
<u>Other electrical</u>			
Energy efficient Power Supply Units for home phones, baby monitors, electronic picture frames etc	X	X	X
Intelligent mains panel and standby savers	X	X	X
Real time electricity displays	X	X	X
Voltage optimisation technologies	X	X	
Light Emitting Diodes	X	X	X
<u>Other</u>			
Shower regulators	X		X

¹⁴ Different products present different degrees of risk here. Those considered of greatest risk are those sent by direct mail. However, there is no assurance on immediate installation for any product which is self installed

ANNEX 4: Illustrative mixes in the July IA and the revised scenarios

ILLUSTRATIVE MIX: CERT Extension Baseline (21 months)

Carbon saving measure	Number of measures				
	SPG	Rest of PG	PG (all)	Non-PG	Total
Cavity wall insulation	275,000	432,908	707,908	692,092	1,400,000
Underfloor insulation	0	0	0	25,000	25,000
Loft insulation professional (from < 60mm)	100,000	300,000	400,000	926,667	1,326,667
Loft insulation professional (from > 60mm)	0	0	0	800,000	800,000
Loft insulation (DIY)	0	50,000	50,000	750,000	800,000
SWI external	1,000	4,000	5,000	0	5,000
SWI external (social sector)	25,000	8,750	33,750	11,250	45,000
SWI internal	1,000	14,000	15,000	0	15,000
SWI internal (social sector)	25,000	12,500	37,500	12,500	50,000
Insulated wallpaper	0	50,000	50,000	25,000	75,000
Flat roof insulation	0	0	0	75,000	75,000
Glazing E to C rated	0	350,000	350,000	350,000	700,000
Draughtproofing	0	0	0	0	0
A/B rated boilers (exceptions)	50,000	50,000	100,000	100,000	200,000
Fuel Switching	45,000	19,286	64,286	10,714	75,000
Heating controls - upgrade with boiler	0	789,921	789,921	52,661	842,582
Heating controls - extra	50,000	861,515	911,515	1,088,485	2,000,000
Wood pellet stoves (secondary)	0	0	0	0	0
Log burning stoves	0	0	0	0	0
Wood pellet boilers (primary)	0	0	0	0	0
Solar Water Heater (4m ²)	0	20,000	20,000	0	20,000
Ground source heat pumps	7,357	2,643	10,000	0	10,000
Air source heat pumps	0	5,000	5,000	0	5,000
Wood chip CHP	0	0	0	0	0
Community GSHP	0	1,500	1,500	500	2,000
Community heating to wood chip	0	0	0	0	0
Replacement of G rated boilers	5,000	0	5,000	833	5,833
CFLs - retail	0	0	0	0	0
CFLs - direct	0	0	0	0	0
Efficient halogens	0	0	0	0	0
LED's	0	454,545	454,545	4,545,455	5,000,000
LED's (social sector)	0	0	0	0	0
Appliances - Cold	0	0	0	0	0
Appliances - Wet	0	0	0	0	0
Appliances - iDTVs	0	0	0	0	0
PC mains panels	0	1,403	1,403	14,030	15,433
Energy saving kettles	0	0	0	0	0
LNBS	0	0	0	0	0
A++ cold appliances	0	200,000	200,000	2,060,000	2,260,000
A++ wet appliances	0	0	0	0	0
Photovoltaic panels (2.5 kWp)	0	0	0	0	0
micro Wind (1 kWp, 10% LF)	0	0	0	0	0
micro Hydro (0.7kWp, 50% LF)	0	0	0	0	0
Mini-wind 5 kW, 20% LF	0	0	0	0	0
mCHP (80% heat, 15% elec)	0	18,750	18,750	6,250	25,000
RTD's	0	1,242,857	1,242,857	207,143	1,450,000
Advice only	0	600,000	600,000	100,000	700,000

ILLUSTRATIVE MIX: OPTION 1 - Revised CERT Extension Baseline (24 months)

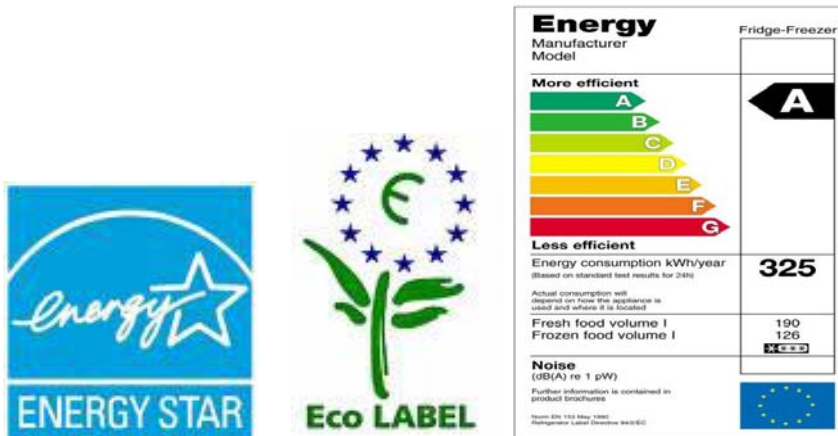
Carbon saving measure	Number of measures					Difference to Baseline
	SPG	Rest of PG	PG (all)	Non-PG	Total	
Cavity wall insulation	275,000	653,091	928,091	671,909	1,600,000	200,000
Underfloor insulation	0	0	0	0	0	-25,000
Loft insulation professional (from < 60mm)	100,000	300,000	400,000	926,667	1,326,667	0
Loft insulation professional (from > 60mm)	0	0	0	800,000	800,000	0
Loft insulation (DIY)	0	50,000	50,000	750,000	800,000	0
SWI external	1,000	0	1,000	0	1,000	-4,000
SWI external (social sector)	25,000	8,148	33,148	11,049	44,198	-802
SWI internal	1,000	0	1,000	2,221	3,221	-11,779
SWI internal (social sector)	25,000	17,825	42,825	14,275	57,100	7,100
Insulated wallpaper	0	0	0	0	0	-75,000
Flat roof insulation	0	0	0	75,000	75,000	0
Glazing E to C rated	0	0	0	350,000	350,000	-350,000
Draughtproofing	0	0	0	0	0	0
A/B rated boilers (exceptions)	50,000	35,714	85,714	114,286	200,000	0
Fuel Switching	45,000	19,286	64,286	10,714	75,000	0
Heating controls - upgrade with boiler	0	0	0	0	0	-842,582
Heating controls - extra	50,000	418,750	468,750	1,531,250	2,000,000	0
Wood pellet stoves (secondary)	0	0	0	0	0	0
Log burning stoves	0	0	0	0	0	0
Wood pellet boilers (primary)	0	0	0	0	0	0
Solar Water Heater (4m ²)	0	0	0	0	0	-20,000
Ground source heat pumps	7,357	0	7,357	0	7,357	-2,643
Air source heat pumps	0	0	0	0	0	-5,000
Wood chip CHP	0	0	0	0	0	0
Community GSHP	0	0	0	0	0	-2,000
Community heating to wood chip	0	0	0	0	0	0
Replacement of G rated boilers	5,000	0	5,000	833	5,833	0
CFLs - retail	0	0	0	0	0	0
CFLs - direct	0	0	0	0	0	0
Efficient halogens	0	0	0	0	0	0
LED's	0	454,545	454,545	4,545,455	5,000,000	0
LED's (social sector)	0	0	0	0	0	0
Appliances - Cold	0	0	0	0	0	0
Appliances - Wet	0	0	0	0	0	0
Appliances - iDTVs	0	0	0	0	0	0
PC mains panels	0	0	0	0	0	-15,433
Energy saving kettles	0	0	0	0	0	0
LNBS	0	0	0	0	0	0
A++ cold appliances	0	66,401	66,401	683,931	750,332	-1,509,668
A++ wet appliances	0	0	0	0	0	0
Photovoltaic panels (2.5 kWp)	0	0	0	0	0	0
micro Wind (1 kWp, 10% LF)	0	0	0	0	0	0
micro Hydro (0.7kWp, 50% LF)	0	0	0	0	0	0
Mini-wind 5 kW, 20% LF	0	0	0	0	0	0
mCHP (80% heat, 15% elec)	0	0	0	0	0	-25,000
RTD's	0	1,227,077	1,227,077	222,923	1,450,000	0
Advice only	0	0	0	700,000	700,000	0

ILLUSTRATIVE MIX: OPTION 2 - Possible Extension Mix (24 months, without appliances, electronics or lighting)

Carbon saving measure	Number of measures					Difference to Option 1
	SPG	Rest of PG	PG (all)	Non-PG	Total	
Cavity wall insulation	275,000	640,546	915,546	684,454	1,600,000	0
Underfloor insulation	0	0	0	25,000	25,000	25,000
Loft insulation professional (from < 60mm)	100,000	300,000	400,000	926,667	1,326,667	0
Loft insulation professional (from > 60mm)	0	0	0	800,000	800,000	0
Loft insulation (DIY)	0	50,000	50,000	750,000	800,000	0
SWI external	1,000	0	1,000	0	1,000	0
SWI external (social sector)	25,000	13,550	38,550	12,850	51,400	7,202
SWI internal	1,000	0	1,000	6,102	7,102	3,881
SWI internal (social sector)	25,000	17,825	42,825	14,275	57,100	0
Insulated wallpaper	0	11,580	11,580	3,860	15,440	15,440
Flat roof insulation	0	0	0	75,000	75,000	0
Glazing E to C rated	0	262,500	262,500	437,500	700,000	350,000
Draughtproofing	0	0	0	0	0	0
A/B rated boilers (exceptions)	50,000	35,714	85,714	114,286	200,000	0
Fuel Switching	45,000	19,286	64,286	10,714	75,000	0
Heating controls - upgrade with boiler	0	0	0	0	0	0
Heating controls - extra	50,000	418,750	468,750	1,531,250	2,000,000	0
Wood pellet stoves (secondary)	0	0	0	0	0	0
Log burning stoves	0	0	0	0	0	0
Wood pellet boilers (primary)	0	0	0	0	0	0
Solar Water Heater (4m ²)	0	0	0	0	0	0
Ground source heat pumps	7,357	2,643	10,000	0	10,000	2,643
Air source heat pumps	0	5,000	5,000	0	5,000	5,000
Wood chip CHP	0	0	0	0	0	0
Community GSHP	0	0	0	0	0	0
Community heating to wood chip	0	0	0	0	0	0
Replacement of G rated boilers	5,000	0	5,000	833	5,833	0
CFLs - retail	0	0	0	0	0	0
CFLs - direct	0	0	0	0	0	0
Efficient halogens	0	0	0	0	0	0
LED's	0	0	0	0	0	-5,000,000
LED's (social sector)	0	0	0	0	0	0
Appliances - Cold	0	0	0	0	0	0
Appliances - Wet	0	0	0	0	0	0
Appliances - iD TVs	0	0	0	0	0	0
PC mains panels	0	0	0	0	0	0
Energy saving kettles	0	0	0	0	0	0
LNBS	0	0	0	0	0	0
A++ cold appliances	0	0	0	0	0	-750,332
A++ wet appliances	0	0	0	0	0	0
Photovoltaic panels (2.5 kWp)	0	0	0	0	0	0
micro Wind (1 kWp, 10% LF)	0	0	0	0	0	0
micro Hydro (0.7kWp, 50% LF)	0	0	0	0	0	0
Mini-wind 5 kW, 20% LF	0	0	0	0	0	0
mCHP (80% heat, 15% elec)	0	0	0	0	0	0
RTD's	0	0	0	0	0	-1,450,000
Advice only	0	0	0	700,000	700,000	0

ANNEX 5: Overview of energy product labelling in the EU

There are three EU product labels applied:



- The '**Energy Star**' label is an endorsement label used to show the most energy efficient office equipment (PCs, printers, faxes, copying machines, monitors etc.). The Energy Star label is voluntary and may be affixed by manufacturers only on those products that meet the qualifying criteria (usually around 25% best range). The Energy Star is a labelling programme owned by the US Government but the Community signed an international agreement with the USA to coordinate labelling for office equipment.
- The "**Ecolabel**" is a voluntary label. It acts as a label of excellence providing the benchmarks for top performance for all environmental aspects during the complete product's lifecycle. The main tool for energy labelling at EU level is the "energy label" under the Directive, which focuses on the energy efficiency of household appliances. This is achieved with the help of a transparent and easy-to-understand energy label, which is fixed at the point of sales on household appliances covered by specific implementing Directives..
- The **Energy label** is compulsory and provides consumers comparative information about the estimated energy consumption between similar appliances enabling them to make a more informed purchasing choice in by alerting them on the cost of running the appliance Most sold appliances correspond now to the levels A or B. An upgraded energy label is being prepared under the current Directive.

ANNEX 6 – mid range options

Different options are available either in conjunction with each other or by themselves. Options include but are not restricted to:

- I. Only award measures their proven carbon saving score, and do not further incentivise innovation;
- II. Enforce lower carbon scores, where there are risks of non installation/ or the product replacing an equally efficient product;
- III. Restrict the routes by which measures can be promoted, for example, to only those installed by an appropriately trained installer;
- IV. Only allow products to be promoted in households also receiving a heating or insulation measure; or following home energy advice;
- V. Introduce a cap on all non heating and insulation measures, in terms of the percentage of the carbon saving target they can meet;
- VI. Only allow for short promotion periods (e.g. schemes of 6 – 12 months), at which point the numbers promoted, the market penetration and carbon scores are reviewed;
- VII. Only allow eligibility for those products meeting the highest EU standards.

ANNEX 7: Extract from Eoin Lees EEC 2 report on the market penetration achieved by various appliances and IDTVs (December 2008).

6. Market Transformation Impacts of EEC2

This section attempts to establish the impact that EEC2 has had on helping to bring about a market transformation, particularly in the field of energy efficient appliances. In doing so, it establishes an estimate of the deadweight associated with EEC2 supported activities in this area as Defra did not make any estimate of such deadweight. In this context, deadweight is taken to be the number of appliances supported under EEC2 which would have occurred in the marketplace without EEC2 support. However, section 3.3 deals in detail with deadweight from electrical appliances and all other measures used in EEC2 and the impacts of this on carbon dioxide saving cost effectiveness and the economic value to GB plc are covered in sections 4.2 and 5.4 respectively.

The market transformation impacts of EEC2 and its predecessors has been most marked for those energy efficiency products where there is an opportunity to change the purchasing decision of the consumer to a more energy efficient solution. In EEC1, this was particularly relevant for white good appliances (i.e. refrigeration, washing and dishwashing appliances) but significant developments occurred in the condensing boiler sector as well. For lighting in EEC1 and EEC2, there was a significant increase in the number of CFLs given or supplied to households but despite this, the market for lighting products remains dominated by incandescent light bulbs.

In contrast, as insulation is primarily about creating rather than changing a purchase decision, there were no significant signs of market transformation and suppliers had to offer insulation measures at considerable discount in order to attract sufficient sales.

The white goods to be studied were determined by looking at the most important measures in terms of energy savings to meet the EEC2 target as shown in Figure 6.1. Clearly, for refrigeration, fridge freezers are the most important (and also the most popular) measure accounting for over 71% of the energy saved by refrigeration. Upright freezers are the other important refrigeration measure accounting for 89% of all freezer savings. Finally, washing machines and dishwashers were also examined.

Prior to the evaluation, concerns had been raised that the energy savings from white goods in EEC2 had contained a lot of deadweight or free riders. In one sense, this is simply illustrated by Figure 6.2 which shows the A-rated market penetration for fridge freezers, washing machines, dishwashers and upright freezers at the start of EEC1, at the end of EEC1 (equivalent to the start of EEC2) and at the end of EEC2. Clearly the growth in A-rated penetration for washing machines and fridge freezers during the EEC2 period looks smaller than for the other products. This observation warranted further investigation to try to estimate the deadweight associated with these appliances.

The key question for the evaluation of EEC2 is what effect, if any, the continued support of white goods by energy suppliers had in advancing the market more quickly than would have otherwise have been the case. The earlier evaluation of EEC1 concluded that the energy suppliers' support had been important along with many other necessary actions in bringing about the market transformation whereby the UK had gone from being one of the laggards in energy efficient refrigeration to being one of the leaders (see Box 2 below). It is also important to note that by the start of EEC1 all the factors mentioned in the box had been successfully undertaken and so the substantial funding available from EEC1 and EEC2 was the missing piece in the jigsaw. The energy savings above business as usual from April 2002 represent the maximum contribution from EEC; a full analysis of whether there were other external factors affecting the uptake of A-rated products such as technological developments or external market developments is beyond the scope of this evaluation. It is worth reiterating that the market

transformation observed in white goods in GB would not have been possible without all the factors listed in Box 1 being enacted.

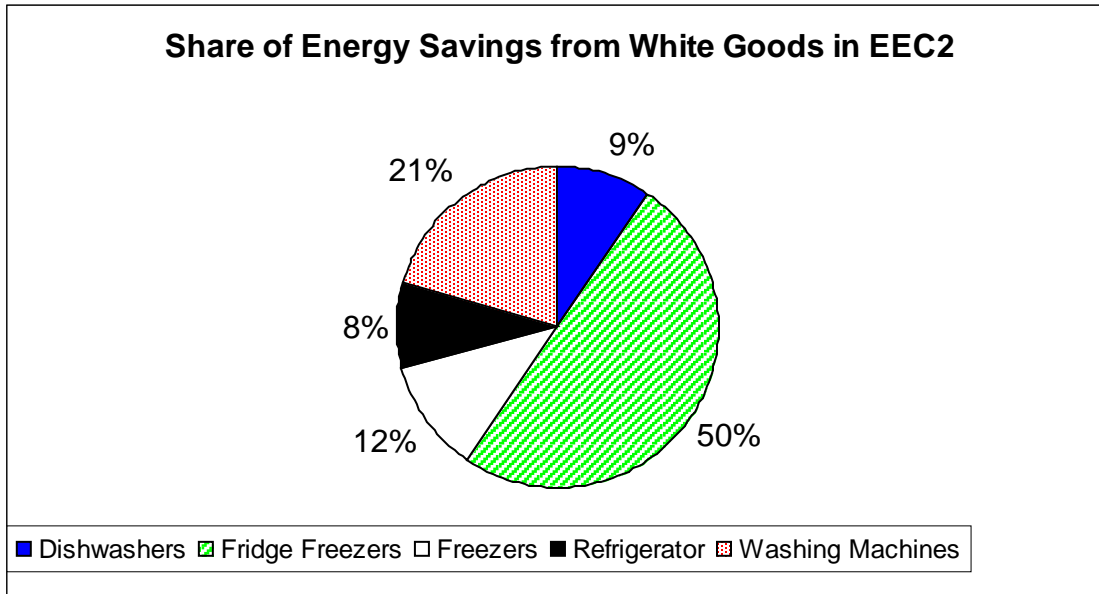


Figure 6.1: The share of the EEC2 energy savings from white good appliances broken down by the key measures utilised by energy suppliers.

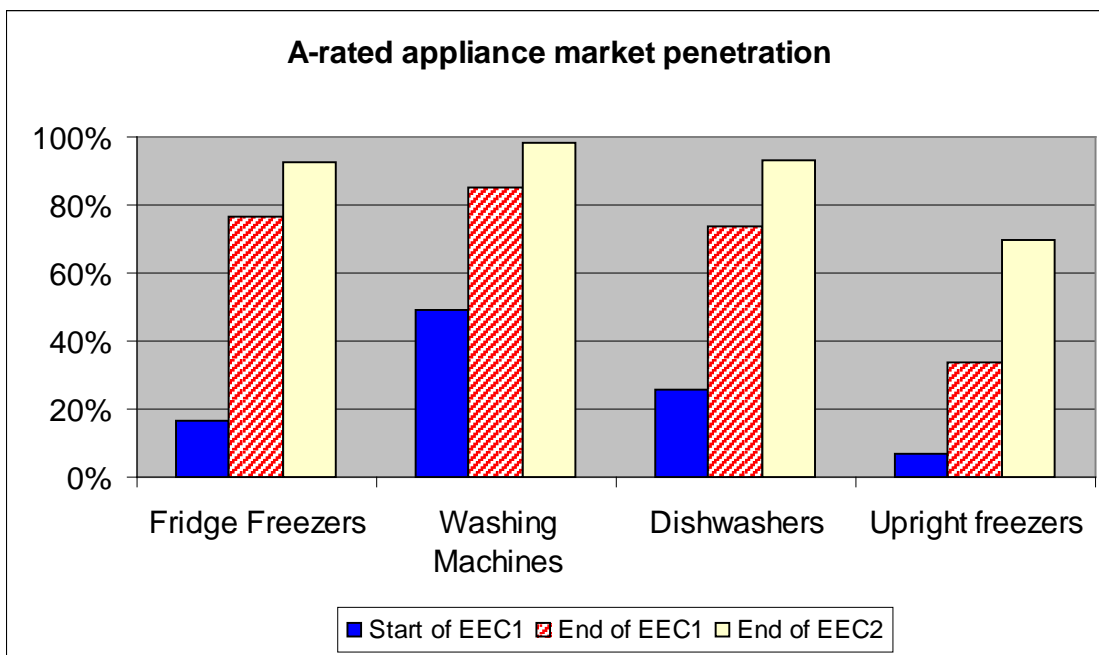


Figure 6.2: A-rated appliance market shares at various stages through the EEC for 4 key white goods.

However, it is undeniable that the market penetration of A-rated white goods at the start of EEC2 was much higher than for EEC1. So what was the added benefit from support in EEC2 or alternatively how much of the energy suppliers' activity in EEC2 was simply deadweight?

BOX2: Factors Influencing the Market Transformation in the Refrigeration Market

- EU energy labelling
- EU Minimum Performance Standards
- Energy Saving Trust and Government marketing campaigns
- Consumer advice from the Energy Efficiency Advice Centres
- Media coverage on climate change
- Retail staff training and point of sale material from the Energy Saving Trust
- Energy Saving Recommended branding and advertising
- EESOP and EEC funding for incentives
- Uplift factor in EEC1 to encourage market transformation

To answer this question, the theory of market penetration curves was applied for the 4 key white goods. Basically, the penetration or market share of a new product tends to follow an S-shaped curve as described in the following section.

6.1 Impact of EEC2 on the Market for Energy Efficiency Products

6.1.1 Fridge Freezer

Using the Energy Saving Trust data which is obtained from GfK, Figure 6.3 shows the fridge freezer market shares broken down by energy rating over the 10 year period ending of March 2008. The growth in the market share of A-rated cold appliances is remarkable particularly in the last six years. Since the start of EEC1, the market share for A-rated products has grown from 16% to 90%.

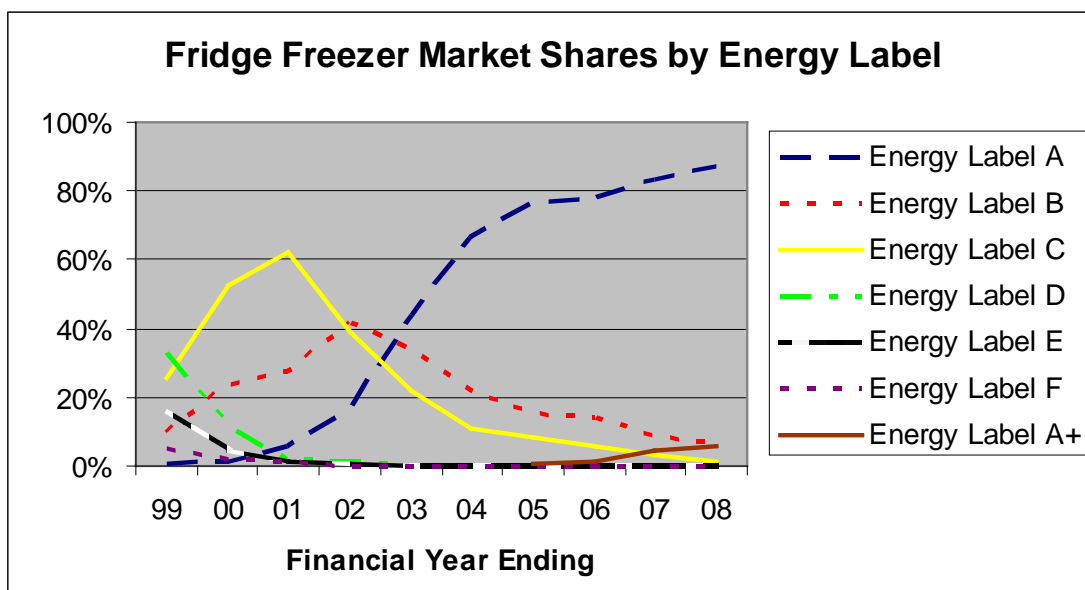


Figure 6.3: Development of the fridge freezer market by energy rating from April 1998 to March 2008 (source EST using GfK data).

Deadweight was estimated using the S-shaped curves developed for the Energy Saving Trust by BRE. The five GfK data points for market share of A-rated fridge freezers from 1997/98 to the start of EEC2 (April 2002) were fitted by the S-shape curve as shown in Figure 6.4. This S-curve was then extrapolated forwards to the end of EEC2. The data points on the actual market penetration of A-rated products sold in each of the financial years are joined by the dashed line. The area between the two curves represents those sales of A-rated fridge freezers that have been advanced by the EEC1 and EEC2 energy supplier activity. Visually, it is clear that in the period to EEC1 (end financial year 2005) there is greater advancement of A-rated fridge freezers than in EEC2.

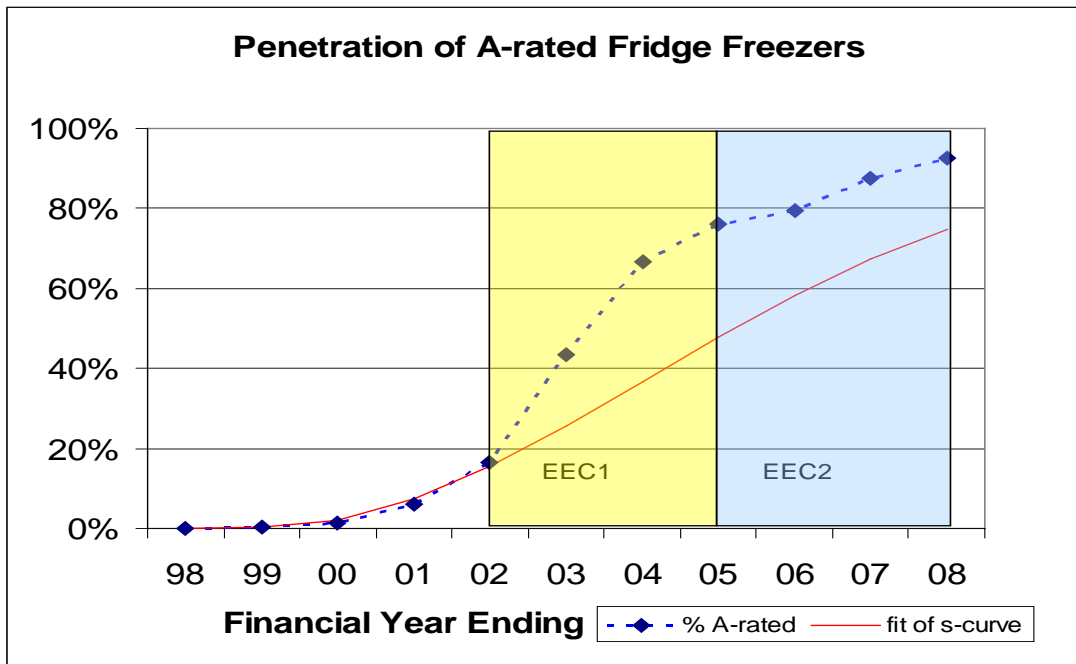


Figure 6.4: Comparison of the S-curve for penetration of A-rated fridge freezers fitted to data in the period 1997/8 to 2001/02 with what happened in the marketplace during the EEC1 and EEC2 periods (Source: EST based on GfK data).

The deadweight was quantified by the equation:

$$\% \text{ deadweight} = 100 * (\text{EEC2 supported sales} - \text{sales advanced in EEC2 period}) / \text{EEC2 supported sales}.$$

The sales advanced in EEC2 were deduced by the difference between the actual market penetration and the S-curve multiplied by the total annual sales of fridge freezers in that year. The results for EEC1 are that deadweight was 34% whereas in EEC2 this rose to 52%. Nevertheless, over the EEC2 period over 2 million fridge freezers were advanced ahead of what would have happened otherwise¹⁵.

It is extremely disappointing that the A+ and A++ energy labelled fridge freezers have made very little impact during the course of EEC2. In the final year of EEC2, the GfK figures showed no penetration of A++ products and only 5.6% of A+. This is undoubtedly linked to the very small differential in energy savings between the A+ and A-rated appliances; for energy suppliers in EEC2, the A+ rated fridge freezer energy savings were less than a factor of two greater than savings from promoting the A-rated appliance. As at the start of EEC2, the price differential between the A+ and A-rated machines was in excess of £80, then from an energy suppliers' perspective such a large price differential and relatively low energy saving difference represents poor cost effectiveness.

By the end of EEC2, this differential had fallen to £30 (all figures from EST, based on GfK data) so with the growing consumer awareness of the need to save energy and reduce carbon dioxide emissions, CERT may have a continuing role in reducing this differential further. However, as the energy savings reduce in absolute magnitude per product, then the promotion of products through energy supplier obligation may not have such a great impact going forward. **It may be that Minimum Energy Performance Standards set on an EU or ideally a global scale, may be a better policy option for certain products.**

6.1.2 Upright Freezers

¹⁵ This analysis provides a first estimate of the influence of EEC; a more detailed study by market transformation experts would include other factors such as neighbouring markets.

Upright freezers are the most important model in the freezer category accounting for 89% of the energy savings from freezers in EEC2. A similar analysis was undertaken as for the fridge freezers and the resulting S-curve and associated data are shown in Figure 6.5.

The deadweight figures were worked out in an identical fashion to those for the fridge freezers and are much lower for the case of upright freezers. For the two EEC periods they are respectively 22% for EEC1 and zero for EEC2, the latter reflecting the recent upsurge in A-rated upright freezers. As this is a much lower selling product (total sales of around 630,000 per annum) than fridge freezers, then the sales advanced during the EEC2 period are around 0.72 million.

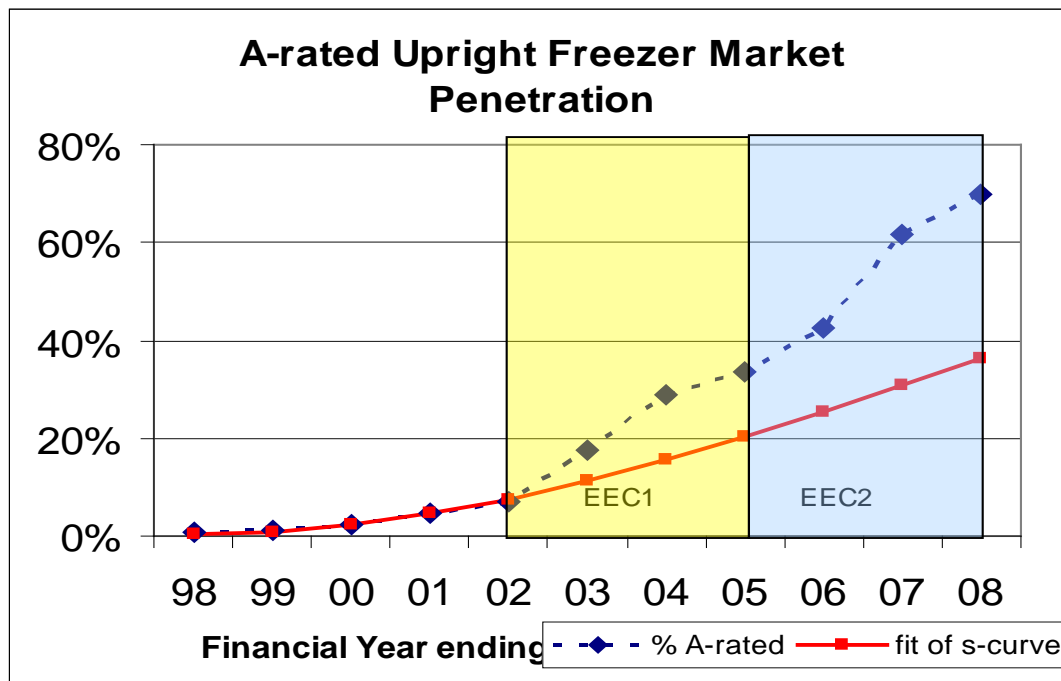


Figure 6.5: Comparison of the S-curve for penetration of A-rated upright freezers fitted to data in the period 1997/8 to 2001/02 with what happened in the marketplace during the EEC1 and EEC2 periods (Source: EST based on GfK data).

6.1.3 Washing Machines

Washing machines are a fairly high volume activity with around 2.5 million sales per annum during the EEC2 period. The analysis of the penetration of A-rated washing machines over the period 1997/98 to the end of EEC2 is shown in Figure 6.6.

It is obvious from the S-curve beyond 2002 that there is very little sign of additional sales being generated by EEC1 or EEC2 activity. Within the statistical accuracy of this exercise, the deadweight is 100% for both the EEC1 and EEC2 phases.

Section 6.2 discusses what might be done in future to minimise the risk of supporting high deadweight products occurring again.

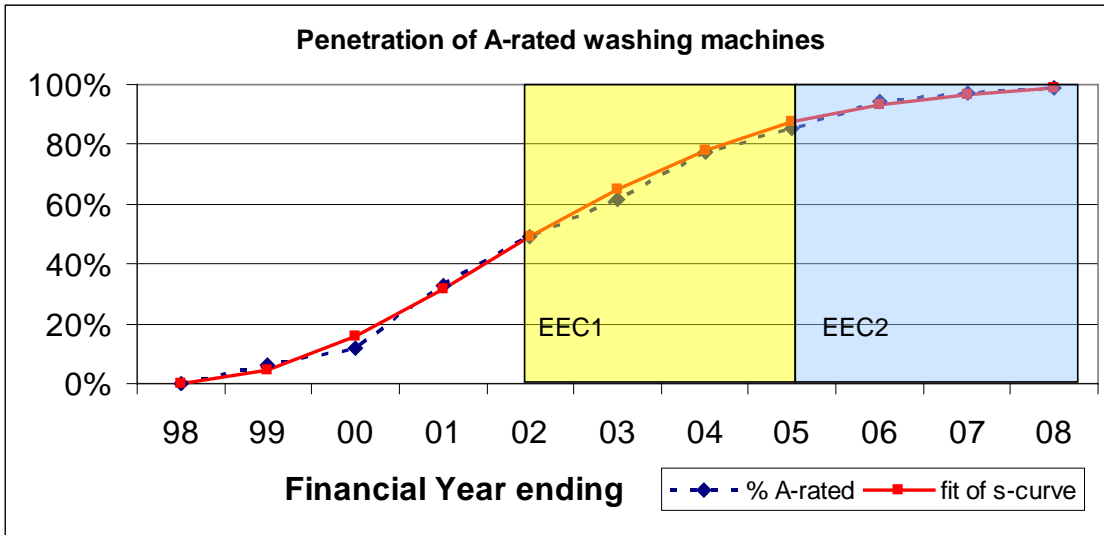


Figure 6.6: Comparison of the S-curve for penetration of A-rated washing machines fitted to data in the period 1997/8 to 2001/02 with what happened in the marketplace during the EEC1 and EEC2 periods (Source: EST based on GfK data).

6.1.4 Dishwashers

Dishwashers have a much lower sales volume than washing machines of around 0.9 million per year during the EEC2 period. Consequently the data fluctuates more than for washing machines. The analysis was carried out as for the other products and the resulting S-curve and sales are shown in Figure 6.7.

The data to the start of EEC1 fluctuate more than for the other products, but it appears that sales of A-rated dishwashers have been advanced since the start of the EEC periods. Analysis of the deadweight yields 34% for EEC1 and 54% for EEC2 – similar to those of the fridge freezers.

6.1.5 Integrated Digital TVs

Although a mature market, television sales have been given a recent boost by the imminent demise of analogue broadcasting. However having separate digital converters and televisions requires more energy than an integrated digital television. Consequently, one of the energy suppliers had a very successful promotion which encouraged manufacturers to switch their models over to the IDTVs.

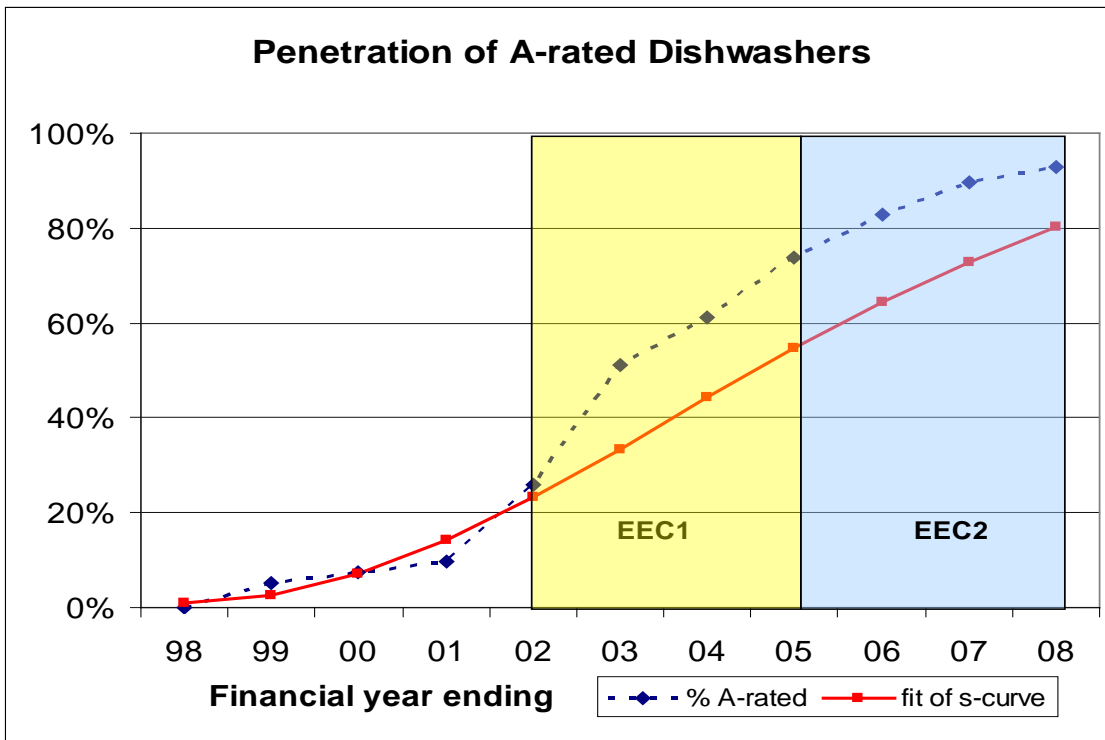


Figure 6.7: Comparison of the S-curve for penetration of A-rated dishwashers fitted to data in the period 1997/8 to 2001/02 with what happened in the marketplace during the EEC1 and EEC2 periods (Source: EST based on GfK data).

Ofgem had already reported the success of this promotion and Figure 6.8 reproduces their data.

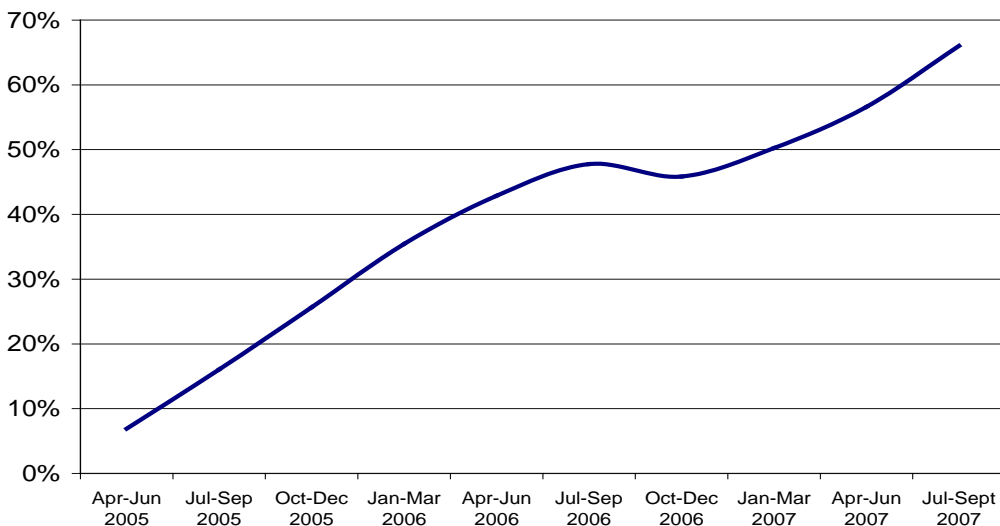


Figure 6.8: Market penetration of iDTVs (Source: Ofgem).

The transformation has been remarkably rapid and this is further supported by the EST's data from GfK. These show that the market grew for all sizes of iDTVs from 1.09 million in the first year of EEC2 to 6 million in the final year with total sales over the EEC2 period of 9.2 million. Within the statistical accuracy of the GfK data, this means that every iDTV sold in GB was supported by the energy supplier.

Given the phenomenally fast transition and growth rates of the product, it is not possible to estimate deadweight by conventional methods. Ofgem have maintained an eye on the market and have ruled that, for CERT, only iDTVs with screen size less than 22 inches will be eligible for support as above that size, the market has completely transformed.

6.2 Keeping Appliance Deadweight to a Minimum in Energy Efficiency Obligations

Clearly it is desirable to minimise the extent of deadweight (or free riders) in any energy efficiency obligation. It also has to be borne in mind that at the design stage of the energy efficiency obligation (typically up to 12 months before the start of the obligations), the policy makers are having to make judgements on the basis of incomplete knowledge. For example, it would probably have been impossible in 2004 to predict precisely the massive growth in iTVs in the final year of EEC2.

However, in Section 6.1 there was a qualitative linkage between the percentage of the market for different appliances that was A-rated at the start of EEC2 and the resultant deadweight when analysed three years later. This section explores further whether this can be used to derive some simple but helpful guidelines on minimising deadweight.

There are also the considerations of financial equity to be taken into account as CFLs and appliances represent energy efficiency measures which individually require modest expenditure by the energy suppliers. This means that the financial benefits of EEC2 can be spread to more customers than say by insulating solid walls which cost typically £4,000 and focus the benefits on a few customers. So there is a tension in wanting to spread the benefits from such schemes widely and minimising the deadweight.

Figure 6.9 plots the percentage deadweight estimated for the four A-rated products discussed in Section 6.1 against the percentage A-rated at the start of the particular phase of EEC1 or EEC2. While there is clearly a correlation, it is far from being exact. The two main outliers are washing machines in EEC1 which had 49% A-rated market penetration but still finished up with 100% deadweight and upright freezers in EEC2 which, despite a 33% A-rated penetration at the start of EEC2, still finished with a deadweight of zero because of the greater than would be expected increase from historical data.

Figure 6.10 plots the level of market penetration for A-rated fridge freezers and the price differential between the A-rated product and the market average. The data set appear to indicate that the price differential for A-rated fridge freezers had fallen below £30 (or less than 10% more expensive) by the time that the market penetration had reached 40%. At the 10% level, the variation between different models and manufacturers will swamp any cost differential for energy efficiency.

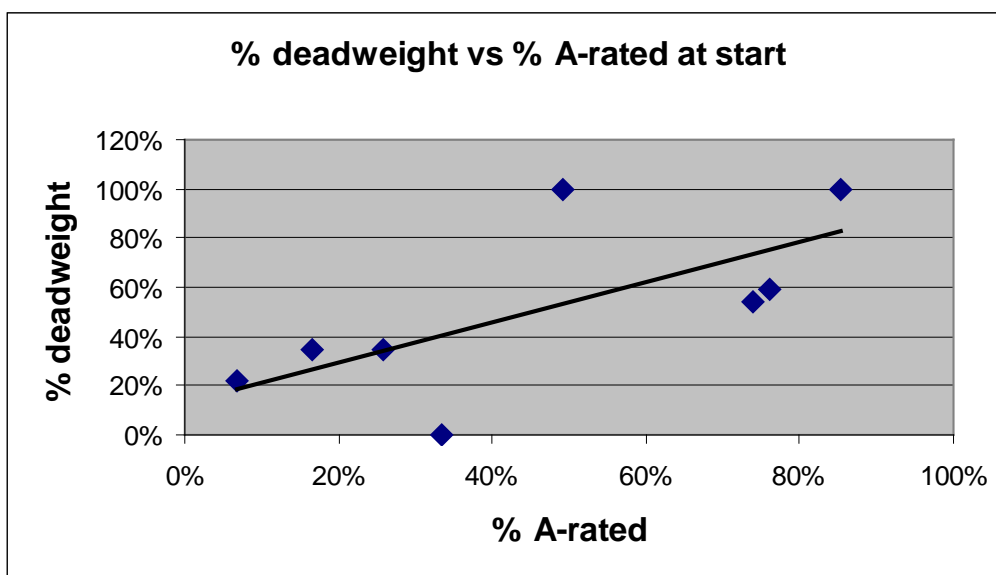


Figure 6.9: Plot of the percentage deadweight figures for the 4 white goods and two phases of EEC against the starting A-rated market share of their market at each phase of EEC.

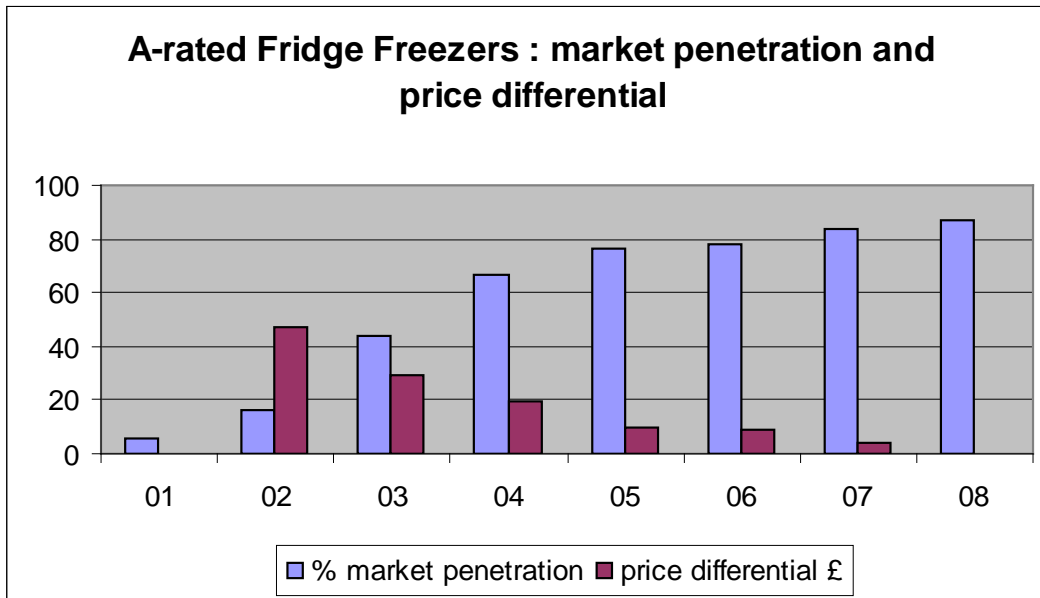


Figure 6.10: Comparison of the market share of A-rated fridge freezers and their price differential with the market average for fridge freezers in that year. (Source EST based on GfK data)

As Defra was happy to include DIY loft insulation in EEC2 with a deadweight which was known to be significant and turned out to be 32%, then this might establish an upper limit on acceptable deadweight for any product. Furthermore, it is also noticeable that for all the products in Figure 6.9, none which had a starting A-rated penetration of less than 34% had a resultant deadweight in excess of 34%.

In summary, while there is a correlation between the market penetration of the energy efficient product and the resulting deadweight, it is far from a simple relationship and is likely to vary on a product by product basis. It is recommended that DECC and Ofgem carry out a further study in this area using all the GfK data available to refine the above more restricted analysis. However, it would already appear prudent for DECC and Ofgem to consider not allowing innovative products to be supported in the next phase of energy efficiency obligations if they had reached a penetration of somewhere between 30 and 40%.

6.3 The Price of Energy Efficiency Measures over Time

Previous evaluations of GB energy efficiency obligations have shown that, as the scale of energy efficiency measures has increased, then the prices of these have fallen in real terms. This is particularly marked for innovative products in lighting, heating and appliances but less so for mature technologies such as insulation. This section explores whether this trend has continued and Appendix 8 describes in detail the sources of data used.

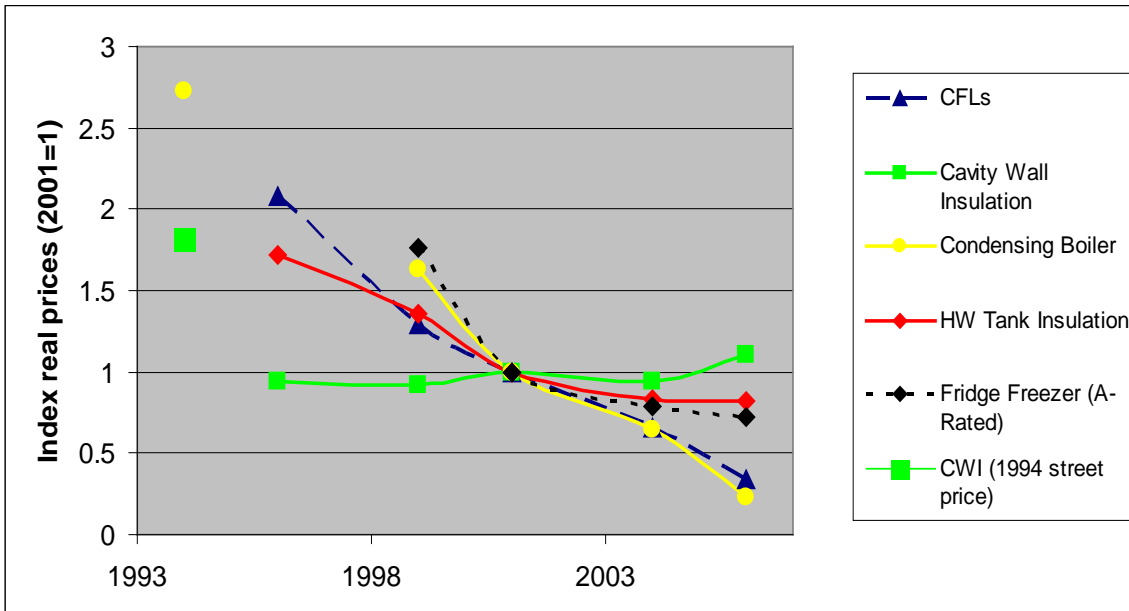


Figure 6.10: The real prices of energy efficiency measures over the period of GB energy efficiency obligations

In Figure 6.10, all prices have been rebased to the 2001 EESOP prices and then indexed to show the trends more clearly. Once again, there have been significant falls in the price of CFLs and condensing boilers as the scale of products sold in both cases has changed dramatically since the 1990s. In contrast, although the installation volume numbers for cavity wall have nearly doubled in EEC2 compare to EEC1, there have been significant price rises due to the high energy content of the insulation material used. Despite that, the prices have only risen 11% in real terms since 2001 and are still well below the prices that pertained for householders in the early 1990s.