

**A review of the Energy Efficiency Standards
of Performance 1994 - 2002**

**A joint report by Ofgem and the Energy
Saving Trust**

July 2003



Promoting choice and value for
all gas and electricity customers

Summary

The Energy Efficiency Standards of Performance ran from 1994 until 2002, delivering energy efficiency measures to households across Great Britain. Offer, and later Ofgem, and the EST developed the programme, the first of its kind and size. Energy suppliers were set targets in 1994, 1998 and 2000 and successfully implemented their energy efficiency programmes throughout the course of the schemes to achieve energy efficiency savings.

The Energy Efficiency Standards of Performance had both social goals and environmental benefits. The majority of customers assisted under EESoP 1 (1994 – 1998) were disadvantaged. In EESoP 2 and 3 suppliers were required to focus around two thirds of their expenditure on this customer group. The energy savings achieved over the eight years have also led to reduced carbon emissions.

Suppliers met their targets by setting up schemes to deliver energy efficiency measures, with the main types being insulation, lighting, heating and appliances. Insulation has been the most common measure delivered by suppliers, as it provides the greatest benefit in terms of saving customers money off their fuel bills as well as improving their comfort.

Building on the success of EESoP, the Utilities Act 2000 gave powers to the Secretary of State to set energy efficiency targets on suppliers. The Energy Efficiency Commitment was introduced by Defra in 2002 to replace the EESoP programme. The EEC targets are over three times size of those imposed under EESoP 3 and will curb carbon emissions by 0.4 MtC per annum, equivalent to around a 1% reduction in carbon emissions from domestic sources.

This review of the EESoP programme provides a background on why and how the scheme was introduced and how it evolved over the eight years. Detail on how each of the targets were set, and what assumptions were used, is provided. Analysis by the National Audit Office in 1998 showed that the overall net financial benefit of the EESoP 1 programme was £250 million. This report also recognises the importance of monitoring and evaluating the delivery of energy efficiency measures and their actual energy savings. A summary of the monitoring work carried out to date is also provided.

In producing this report, Ofgem and the EST have taken the opportunity to highlight the key lessons learnt through their roles in administering and developing the EESoP programme.

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1. Opening statements

Callum McCarthy, Ofgem

- 1.1. Suppliers have successfully implemented their energy efficiency programmes throughout the course of the Energy Efficiency Standards of Performance schemes providing a wide range of measures to consumers. For those who have benefited from these programmes, these measures reduced fuel bills and provided increased warmth. For the low-income customers who benefit, they have helped reduce fuel poverty. We are most grateful to the Energy Saving Trust for the help they have provided Ofgem, and before that Offer, in setting up and administering the EESoP schemes over the years.
- 1.2. Although the responsibility for setting the suppliers' energy efficiency target now rests with Defra, Ofgem maintains an active interest through the administration of the programme. In the forthcoming year Ofgem will continue to work with Defra and the Energy Saving Trust to ensure that the second round of the Energy Efficiency Commitment is introduced as seamlessly as possible so that the suppliers' delivery of energy savings measures to consumers is not disrupted.
- 1.3. The development of the EEC has led to an acceleration in the suppliers' energy efficiency activity. Suppliers have continued to develop EEC schemes that bring extensive benefits to consumers especially those on low incomes. Their work has shown that they have been able to combine new ideas and their commercial acumen to promote energy efficiency and to integrate it with the other services they provide to consumers.
- 1.4. Of course the provision of energy efficiency measures is not the only way consumers can benefit from energy efficiency. Ofgem reported on the quality of the suppliers' energy efficiency advice lines in June 2002. In some cases this work showed that there was considerable room for improvement, and Ofgem will check again this year on the performance of companies in this important area. We hope that this "mystery shopping" enquiry will show clear and sustained improvement.

- 1.5. Ofgem will continue to work closely with the suppliers in overseeing their progress in meeting their EEC targets. We will use our experience as administrator to help inform future energy efficiency policy. Ofgem is keen to work closely with Defra and to contribute to the development of the EEC post 2005.

Peter Lehmann, Energy Saving Trust

- 1.6. The Energy White Paper focussed heavily on the need to achieve a reduction in carbon emissions, and energy efficiency is one of the key activities for achieving such a reduction. In turn, the Energy Efficiency Commitment (EEC) is the most important single measure for increasing household energy efficiency.
- 1.7. This key role for EEC is a direct result of the EESoP programmes and also of the careful work which has always been carried out to evaluate the effects of the programmes. So this report is very timely. It demonstrates the benefits of the programmes in decreasing carbon emissions and reducing the scourge of fuel poverty. It highlights the creativity of the supply companies and the engagement of retailers, installers and manufacturers.
- 1.8. The report will also be very helpful in answering the critics of energy efficiency – who call for more analysis, even though there has been much more comprehensive analysis of energy efficiency than of most aspects of energy. It will also be of great interest to policy makers and others abroad.
- 1.9. The Energy Saving Trust is proud to have played a key role in setting up and administering the schemes on behalf of Offer/Ofgem. We are grateful to Ofgem, and more recently Defra, for the vital role they have played and to energywatch for their support.
- 1.10. Energy efficiency is now, as a result of EEC, a much more critical part of the energy companies' marketing and brand strategies. The challenge for the future is to develop this still further, especially by stimulating the provision by the energy companies of packages of energy services.
- 1.11. I hope that this report – by demonstrating so graphically the success of the EESoP energy efficiency schemes – will give us all the confidence vigorously to drive forward the programmes for energy efficiency.

Henry Derwent, Defra

1.12. As this report shows, the three EESoP programmes worked successfully over the period 1994-2002. They contributed to the UK Climate Change Programme by cutting greenhouse gas emissions and also benefited low-income consumers. The good work carried out by the electricity and gas suppliers, Ofgem and the Energy Saving Trust in delivering these programmes has laid the foundations for the Energy Efficiency Commitment. I welcome the significant steps that suppliers have taken to raise their levels of activity in promoting household energy efficiency, to respond to the challenge of the current EEC.

1.13. Looking to the future, the Energy White Paper makes clear the Government's commitment to a step change in energy efficiency, and that we will consult on an expansion of the EEC to run from 2005 to at least 2008, at possibly twice its current level of activity. The Department has begun useful discussions on the next EEC with a wide range of stakeholders, with a view to developing proposals for a statutory consultation in spring 2004. I look forward to the continuing input to this process of all those who are involved.

Ann Robinson, energywatch

1.14. During the 8 years of the Energy Efficiency Standards of Performance (EESoP) programmes around 4.5 million households benefited from energy saving measures. The programmes reduced carbon emissions, increased comfort and tackled fuel poverty.

1.15. With the Energy Efficiency Commitment already in full flow, energy suppliers can make a significant difference to the lives of all consumers, encouraging them to take action to improve their homes through promotion of their energy efficiency advice lines and providing the opportunities and financial support to take action through their Energy Efficiency Commitment. Not only can this build on the achievements of the EESoP programme, but it can also contribute to the delivery of other social objectives such as targeting consumers who are struggling to pay their bills, or who have fallen in to debt.

1.16. energywatch will also be playing its part, as we develop more extensive referral networks and are able to identify and pass on to specialist agencies and to suppliers those consumers who come to us for help.

2. Introduction

- 2.1. The first Energy Efficiency Standards of Performance (EESoP) programme was created by Offer in 1994, with the help of the Energy Saving Trust. It was the first energy efficiency programme of its kind and scale, setting energy saving targets on domestic energy suppliers. Two further EESoP programmes followed, in 1998 and 2000, each setting progressively more challenging energy efficiency targets on suppliers. EESoP 1 and 2 targets were set on the Public Electricity Suppliers (PESs) with an allowance through the supply price control (and the 1998 supply price restraint) to collect £1 per franchise customer per annum. To reflect the liberalisation of the market, in 2000, EESoP 3 targets were placed upon all licensed gas and electricity suppliers with at least 50,000 domestic customers.
- 2.2. The EST advised Offer, and later Ofgem, on how the targets should be set and what scale they should be. Suppliers met their targets by setting up schemes to promote energy efficiency measures, with the main types being insulation and lighting as well as heating and appliances. The EST devised a system for pre-assessing schemes to determine the forecast energy savings which could be achieved over the lifetime of the measures.

Key messages from the EESoP programme

Supplier capability

- (a) The EESoP programme has demonstrated that suppliers are capable of meeting, and exceeding, the energy efficiency targets set. Over the eight years of the programme suppliers have developed in-house expertise through managing and delivering energy efficiency schemes. Under the EEC suppliers are beginning to incorporate energy efficiency into their core marketing.

Cost effectiveness

- (b) The NAO carried out a study of the EESoP 1 programme¹ and concluded that the overall net financial benefit was £250m. This figure takes account of the funds levered in from third parties, such as social housing providers, through effective partnerships set up by suppliers.

Social benefits

- (c) The NAO report concluded that 3 million households benefited from EESoP 1, with financial savings worth on average £120 over the lifetime of the measures. They concluded that the cost of saving electricity was less than the cost of purchasing it. Customers also benefited from comfort improvements in terms of warmer homes and better lighting. Each programme concentrated efforts to target disadvantaged customers who were on low-incomes, elderly or in debt, therefore focusing the benefits on those most in need.

Environmental benefits

- (d) The energy savings achieved over the EESoP programme have led to a carbon reduction of 4.4m tonnes over the lifetime of the measures. The environmental benefit of the EESoP programmes were highlighted in the Government's Climate Change Programme².

Monitoring, evaluation and auditing

- (e) To ensure the success of programmes the delivery was monitored and evaluated to determine whether the actual results match the theoretical energy savings assumed in target setting. The EESoP programme addressed these issues by carrying out a range of monitoring projects. Audits have been undertaken throughout EESoP to verify suppliers' performance.

Building on EESoP

- 2.3. The Utilities Act 2000 gave powers to the Secretary of State to set the overall energy efficiency targets on suppliers. The Energy Efficiency Commitment

¹ Improving Energy Efficiency Financed by a Charge on Customers, July 1998, National Audit Office

replaced the third EESoP programme in April 2002. It differs in several important ways from the EESoP programme, but builds on the basic methodology. The overall policy framework has been devised by Defra, with Ofgem required to administer the three-year programme. The EEC targets are over three times the size of those imposed under EESoP 3 and are expected to achieve carbon savings of 0.4 MtC, equivalent to around a 1% reduction in carbon emissions from domestic sources, each year.

- 2.4. The Government's White Paper, 'Our Energy Future – creating a low carbon economy', recognised the importance of energy efficiency in reducing carbon emissions. The EEC in particular has a major role to play in curbing emissions from households. The Government plans to consult on expanding the EEC to run from 2005, possibly at twice the current level of activity.

About this report

- 2.5. This report is intended to give a complete overview of the EESoP programmes. Chapter 3 covers the regulatory background to the schemes and the suppliers' achievements. It also sets out the types of measures and delivery routes that the suppliers employed in meeting their targets. Chapter 4 then gives an overview of the measures that were installed by the suppliers to meet their targets. Chapter 5 summarises the work on the evaluation of energy and carbon savings from the schemes. Chapter 6 then goes on briefly to outline the increase in activity that has occurred as a result of the introduction of the Energy Efficiency Commitment. The final chapter discusses the lessons learned from the programme and how these could be taken into account when setting up similar schemes in future. A glossary of key terms is provided in Appendix 1. Appendix 2 covers the target setting process. Appendices 3 to 5 cover the detailed results from the EESoP programmes.

3. Background to the EESoP programmes

Figure 3.1 The EESoP programmes at a glance

	EESoP 1	EESoP 2	EESoP 3
Timescales	1994 ³ -1998	1998 - 2000	2000 – 2002
Energy saving target ⁴	6103 GWh (electricity)	2713 GWh (electricity) (Each target negotiated per supplier)	4981 GWh (electricity) 6144 GWh (gas)
Expenditure allowance	£1 per franchise customer per year allowed through the supply price control	£1 per franchise customer per year allowed through the supply price restraint	£1.20 per customer per fuel per annum, <i>indicative in target setting model</i>
Supplier cost of the programme	£101.7 million	£48.1 million	£110 million (indicative)
Suppliers with a target	14 Public Electricity Suppliers	14 Public Electricity Suppliers	All suppliers with over 50,000 gas or electricity domestic customer numbers ⁵
Scope	Electricity customers	Electricity customers	Electricity and gas customers

³ The Standards were introduced in Scotland in 1995.

⁴ Targets for each programme are not directly comparable as factors changed and assumptions were updated.

⁵ As well as the regional electricity suppliers, EESoP 3 set targets on Amerada, British Gas, Elf at Home and Independent Energy

Social focus ⁶	The target was based upon 30% of measures being for disadvantaged customers. This was not a target on suppliers but something to take into account	Each supplier had a target to achieve between 60 – 80% of their expenditure on projects for low income customers	67% of the total expenditure targeted at disadvantaged customers
Allowance for R&D and energy monitoring	3% of the expenditure was allocated for quality, customer satisfaction and energy monitoring	0.42% of the money allowance for R&D. £300,000 contributed by suppliers for monitoring	0.5% of the nominal expenditure for monitoring and 0.25% for R&D

3.1. Each EESoP programme built on the previous one, setting progressively more challenging energy efficiency targets on suppliers. EESoP 1 and 2 targets were set on the Public Electricity Suppliers (PESs), giving them allowance through the supply price restraint to collect £1 per franchise customer per annum. To reflect the liberalisation of the market, and there being a single regulator, EESoP 3 targets were placed upon all licensed gas and electricity suppliers with at least 50,000 domestic customers. These targets were based upon them spending £1.20 per customer per fuel per annum with the onus being on suppliers to meet their targets as cost effectively as possible. Suppliers were not required to spend a fixed amount of money.

3.2. Throughout each programme, the EST advised the Regulator on how the targets should be set and what scale these targets should be. Suppliers met their targets by setting up schemes to promote energy efficiency measures. The EST assessed each supplier's scheme proposals and monitored the delivery of these schemes. They devised the overall framework of each programme, with the Regulator formally setting the policy and ensuring compliance.

⁶ This group will be referred to as 'disadvantaged customers' throughout the report.
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The introduction of the Standards of Performance

- 3.3. In devising the 1994/5 – 1997/8 supply price control, Offer introduced an allowance for each of the 14 PESs to collect money from franchise customers to fund this energy efficiency work.
- 3.4. Following a consultation it was decided to set the money collected for this purpose at £1 per franchise customer per year. This resulted in £100m being collected to fund energy efficiency work over the four years of the first programme. In setting this figure, Offer took the view that if costs were to be any higher it would be more appropriate for Government to make expenditure through general taxation rather than the price control. Provision was only given to collecting money from domestic and small business franchise customers (with maximum demand not exceeding 100 kW) as the larger non-domestic market had already been opened up to competition, and there was no price control mechanism to provide for funding.
- 3.5. In order to ensure that the money collected was spent upon worthwhile projects, a minimum energy saving target – the Standard of Performance - was placed upon each supplier. The overall target was determined following advice given by the EST who devised a system for pre-assessing schemes to determine the forecast energy saving over the lifetime of the measures. In 1994 there was little experience in delivering energy savings projects to the scale of the Standards. Mechanisms were therefore put in place to monitor the delivery of schemes and examine their costs and benefits. It was hoped that such monitoring would address many of the uncertainties surrounding the programme in terms of the customer demand, the actual cost of the measures and the cost contributions that could be levered in from customers and third parties.
- 3.6. Ofgas made provision in British Gas' 1992 price control for the recovery from customers of the costs of approved energy efficiency schemes, through a mechanism known as the E factor. No specific targets were set for the E factor, and in comparison with the EESoP programmes it was very limited in scope. Two schemes were funded under the E factor, one promoting high efficiency condensing boilers and another residential CHP installations. The cost of these schemes was £2m each.

EESoP 1 1994 – 1998

- 3.7. EESoP 1 set energy saving targets, and an expenditure allowance, on the 14 PESs in relation to their number of customers. These targets prescribed the minimum savings each supplier had to achieve. There were a number of broad criteria that the suppliers were required to adhere to in delivering their schemes. The EST assessed schemes to determine whether they were cost-effective and that the benefits to the consumer generally exceeded the cost of the scheme. Suppliers had to demonstrate that they had taken the interests of consumers into account, particularly those who were elderly, disabled, lived in rural areas or had difficulty in paying for their electricity. The targets were set on the assumption that suppliers would offer a range of different energy efficiency measures.
- 3.8. Suppliers devised a wide variety of schemes to assist households, and some small businesses, across GB. The EST also ran a number of national schemes, mainly delivering lighting and appliances, pooling resources from each supplier. Those suppliers who exceeded their targets within budget were given some flexibility in how they spent the remainder of the revenue. More innovative 'flexibility' projects were therefore set up including educational and demonstrative projects, for example 'energy' school plays and installing wind turbines in communities.

EESoP 2 1998 – 2000

- 3.9. The 1998 – 2000 price restraint for suppliers made allowance for £1 to be collected per annum from each domestic customer and small businesses with an annual demand less than 12,000 kWh. The EESoP 2 targets were set using a similar methodology to EESoP 1, however greater regard was given to regional variations such as cost. Suppliers were able to negotiate a proposed mix of measure types with the EST to reflect the available property types in their region as well as the characteristics of the region (e.g. the proportion of rural customers). The average proposed mix of measure types was lighting 39%, insulation 41% with the remainder being appliances and other measures. EESoP 2 prescribed a target on each supplier to achieve between 60% and 80% of their expenditure on projects for low-income customers. This group again included

those who were elderly, disabled, lived in rural areas or had difficulty in paying for their electricity.

EESoP 3 2000 – 2002

- 3.10. To reflect the liberalisation of the market, and the merger of Offer and Ofgas, EESoP 3 was introduced to include all licensed gas and electricity suppliers with over 50,000 domestic customers. As well as the 14 ex-PESs, four other suppliers were given targets. The overall target was set based upon suppliers spending £1.20 per customer per fuel per annum. Suppliers were not required to spend a fixed amount on energy efficiency. Instead, the onus was upon them to meet their targets as cost effectively as possible. The overall target was apportioned to each supplier in relation to their domestic customer numbers on 30 September 1999. To reflect the ability of customers to switch supplier, the targets were revised based upon domestic customer numbers on 30 September 2000. While small non-domestic customers were eligible to benefit from EESoP 3, each scheme had to be primarily designed to assist households. EESoP 3 also saw suppliers begin to operate their schemes on a national, rather than a regional, level.
- 3.11. Because the 1998 NAO report suggested that the need for suppliers to achieve a specific mix of measures be reviewed, to ensure the cost effectiveness of the programme, suppliers were encouraged to meet their targets using a variety of measures in EESoP 3, but no requirements were set. Suppliers did however agree to achieve 12% of their electricity targets through appliance schemes. As EESoP 3 set targets to save gas as well as electricity, the scope of measures and eligible properties increased. Also, suppliers were not limited to providing measures to their own customer base. Each supplier was required to focus two-thirds of their expenditure on disadvantaged customers, as defined under the previous programmes.
- 3.12. EESoP 3 provided an incentive for suppliers to deliver schemes as an energy service. Whereas the accreditation of energy savings for conventional schemes was based on the proportion of a supplier's cost contribution, suppliers were accredited with all of the energy savings resulting from energy services schemes, regardless of the cost contribution from the customer.

- 3.13. Suppliers who exceeded their EESoP 3 targets are able to carry over these additional energy savings to the EEC. The procedures for 'carry over' reflect the fact that suppliers were not required to spend a fixed amount of money and also enabled a smooth transition from EESoP 3 to the EEC. This procedure was put in place towards the end of the EESoP programme.

Administration of the programmes

Target setting

- 3.14. The EST advised Offer, and later Ofgem, on how the Standards should be set and on what scale. The targets were set by assessing what types and numbers of energy efficiency measures could be delivered for a given amount of money. This took into account the potential within the housing stock for such measures to be installed. Insulation, lighting and appliances were the main measure types in EESoP 1 and EESoP 2 with heating becoming more significant under EESoP 3. The criteria imposed on suppliers reflected the assumptions used in target setting, for example, the number of measures to be provided to disadvantaged customers. The assumptions used in target setting, such as the cost of measures, were assessed and refined with each programme.

Scheme accreditation

- 3.15. Suppliers met their EESoP targets by setting up a range of schemes to promote energy efficiency measures. Each scheme proposal was submitted to the EST who would then endorse the scheme in terms of the proposed methodology and expected energy savings. The Regulator would then formally approve the supplier's scheme. The savings achieved by schemes were calculated on the basis of pre-determined (ex-ante) assessments. The lifetime of the measures was taken into account with their energy savings being discounted⁷ over this period.
- 3.16. On the completion of a scheme, suppliers would report to the EST to confirm what measures had been delivered and how. Once the EST had given their

⁷ Energy savings were discounted to represent the future value of the energy savings.
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endorsement, the Regulator approved the final scheme and the energy savings achieved accrued to the target.

Monitoring

- 3.17. Procedures were put in place to monitor the progress of each scheme as well as each supplier's overall progress in meeting their targets. The delivery of each scheme was monitored to ensure quality and customer satisfaction. Quality monitoring involved sampling 5% of installations of insulation and heating measures to determine whether the correct standards had been met in terms of quality and safety. 5% of the recipients of each scheme were also monitored to gauge their views on the measures and the work carried out. Under EESoP 3 the EST devised set questions for suppliers to ask recipients of measures under their schemes with the aim that the results could be used to inform future policy. A selection of the supplier's schemes were also audited over the eight years to ensure that their records demonstrated compliance with the requirements for each programme.
- 3.18. An allowance was made when setting the targets for a proportion of the money collected by suppliers to be used to fund monitoring projects. These compared the actual effects of certain energy efficiency measures against the theoretical, 'ex-ante', values. Further detail is provided in Chapter 5.

4. Achievements of the EESoP programmes

4.1. This chapter of the report provides an overview of the results and achievements of the EESoP programmes. Figure 4.1 presents data in the original reporting basis of the programmes. The assumptions used for target setting for each programme were refined each time. This makes a direct comparison difficult, so the remainder of the section presents data from each programme on a consistent reporting basis. Appendices 3, 4 and 5 detail the achievements of each programme.

Results of the EESoP programmes 1994 – 2002

Achievement against targets

4.2. Since the start of the EESoP programmes in 1994, energy suppliers have implemented in excess of 800 successful energy efficiency schemes in order to meet their targets. Figure 4.1 below illustrates the achievements of the three programmes, compared with the original target assumptions.

Figure 4.1 Overview results of the EESoP programmes⁸

EESoP Programme	Targeted Energy Savings (GWh)	Accredited Energy Savings (GWh)	Target overachievement
EESoP 1	6,103	6,805	11.5%
EESoP 2	2,713	3,052	12.4%
EESoP 3 Gas	6,144	6,201	0.9%
EESoP 3 Electricity	4,981	5,041	1.2%

⁸ Note: Energy savings are shown as discounted lifetime savings.

- 4.3. As figure 4.1 shows, each of the EESoP energy saving targets were met by the suppliers, both individually and in aggregate. It also shows that suppliers overachieved both the EESoP 1 and 2 targets. Under these first two programmes, the suppliers had both an energy saving target and an expenditure target; any underspend went on further energy efficiency measures. This underspend resulted from the improving expertise of the energy suppliers in delivering schemes and their success in finding cost-effective ways to provide energy efficiency measures to customers. In EESoP 3 suppliers only had an energy saving target to reach and consequently there was no additional money to spend on further energy efficiency measures.
- 4.4. Suppliers were also allowed to provide measures to small non-domestic customers during the EESoP programmes. Of the total savings accredited to suppliers, 366GWh (1.7%) were attributable to non-domestic customers.

Social benefits

- 4.5. The energy savings delivered by the EESoP programmes have resulted in benefits for customers in terms of both reduced energy bills and improved comfort. The majority of these benefits have been enjoyed by disadvantaged customers because Offer decided the programmes should have a social focus to mitigate against the regressive impact of imposing a levy on all consumer's bills to pay for energy efficiency measures.
- 4.6. Suppliers targeted this group in a number of ways. Amongst the most popular was to integrate schemes with social housing providers. In this way suppliers could target a large number of low-income consumers and offer them the benefits of energy efficiency at little and no cost by leveraging in funds from the social housing provider. Some suppliers also tied in with the Warm Front Managing Agents under EESoP 3. These schemes tended to involve buying back measures installed under Warm Front so that the Managing Agent had more flexibility in the measures that it could provide to other households. Suppliers also provided top-up grants to ensure that whole-house solutions were provided to consumers and to upgrade boilers to a condensing gas boiler.
- 4.7. Suppliers also provided energy efficiency solutions to their own consumers who were in need. Some suppliers ran schemes that were targeted at their consumers

that were in debt. Encouraging these consumers to be more energy efficient was seen as a way to help manage the problem of debt and hopefully, in the longer term, help eradicate it. Other suppliers ran schemes with their pre-payment meter customers.

- 4.8. The NAO carried out a study of the EESoP 1 programme⁹ and concluded that including contribution from third parties, the overall net financial benefit was £250m. Comfort improvements, in terms of warmer homes and, better lighting equated to £80m. 3 million households benefited saving on average £120 off their bills. The price of electricity at the time was 7.1 p/kWh (on peak) and 2.7 p/kWh (off peak). The NAO concluded that the cost of saving electricity was 1.8 p/kWh and that the scheme provided a net financial benefit for customers. The environmental benefits were not ignored, with the NAO estimating that EESoP 1 led to carbon dioxide emissions reducing by around 6 million tonnes, around ¼ percent of the UK carbon emissions from 1994 – 1998.

The annual achievements of the EESoP programmes 1994-2002

- 4.9. In order to allow a comparison of the three EESoP programmes, the remainder of this chapter presents the various results and trends on a standard reporting basis, using the EESoP 3 methodology.

Numbers of measures installed

- 4.10. Broadly, the outturn of the programmes has mirrored the target assumptions. Figure 4.2 below illustrates the split of energy savings across these main groups of measures, in terms of both the target assumptions and the final outturn for each of the programmes. The contribution of energy savings from lighting has been significant but, as figure 4.2 clearly shows, insulation measures have dominated. The EESoP 3 measure mix set out below is that used in setting the targets. Suppliers were not required to deliver a specified measure mix under EESoP 3.

⁹ Improving Energy Efficiency Financed by a Charge on Customers, July 1998, National Audit Office
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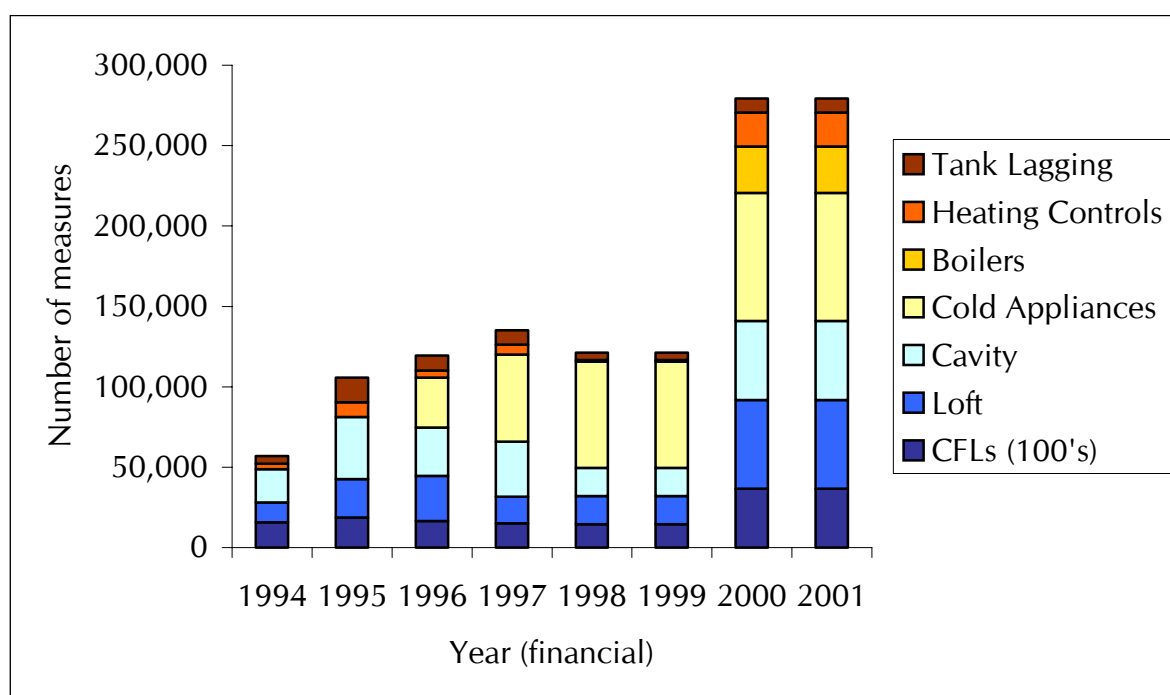
Figure 4.2 Split of energy savings by measure type as set in the target and as actually achieved

Measure Type	EESoP1		EESoP 2		EESoP 3 Gas		EESoP 3 Electricity	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Lighting	35%	32%	39%	45%	n/a	n/a	57%	62%
Insulation	55%	59%	41%	35%	56%	70%	25%	21%
Appliances /other domestic	5% *	4%	16%	16%	2%	0%	18%	17%
Gas Heating	n/a	n/a	n/a	n/a	42%	30%	n/a	n/a
Non domestic	5%	5%	4%	4%	n/a	n/a	n/a	n/a

* Originally set at 25% but reduced to 5% due to the high cost of appliance schemes and the difficulty in getting schemes off the ground.

4.11. Figure 4.3 below illustrates the total number of key measures installed by the three programmes. For the purposes of figure 4.3 the key measures are hot water tank, cavity wall and loft insulation, boilers, heating controls, cold appliances and CFLs. Greater detail on all measures installed is given in the appendices to this report.

Figure 4.3 Number of key measures installed 1994 - 2002



4.12. The relatively small number of measures installed in 1994 reflects the fact that suppliers were still planning how best to meet first energy efficiency their target and were not up to full operational output. The numbers of measures installed under EESoP 1 gradually grew throughout the four years of the programme, with approximately 170,000¹⁰ measures being installed in the 1997/8 financial year. For EESoP 2 and 3, analysis of each supplier's interim progress reports showed that approximately 50% of the energy savings were achieved in each year of the programmes. Hence the installed measure numbers have been averaged out in the graph above.

4.13. Figure 4.3 shows that CFLs, cavity wall, loft and tank insulation and cold appliances were the staple energy efficiency measures of the EESoP programmes. Suppliers were finding it increasingly difficult to identify electrically heated properties which could benefit from insulation measures. The EESoP 2 targets were therefore set on the basis of almost 60% of the measures being lighting and

¹⁰ This figure includes all measures, except CFLs and therefore differs to that in figure 4.3. CFLs are excluded as the large number delivered can distort the overall numbers of measures. All other measures are included such as non-domestic measures, CHP and draught proofing.

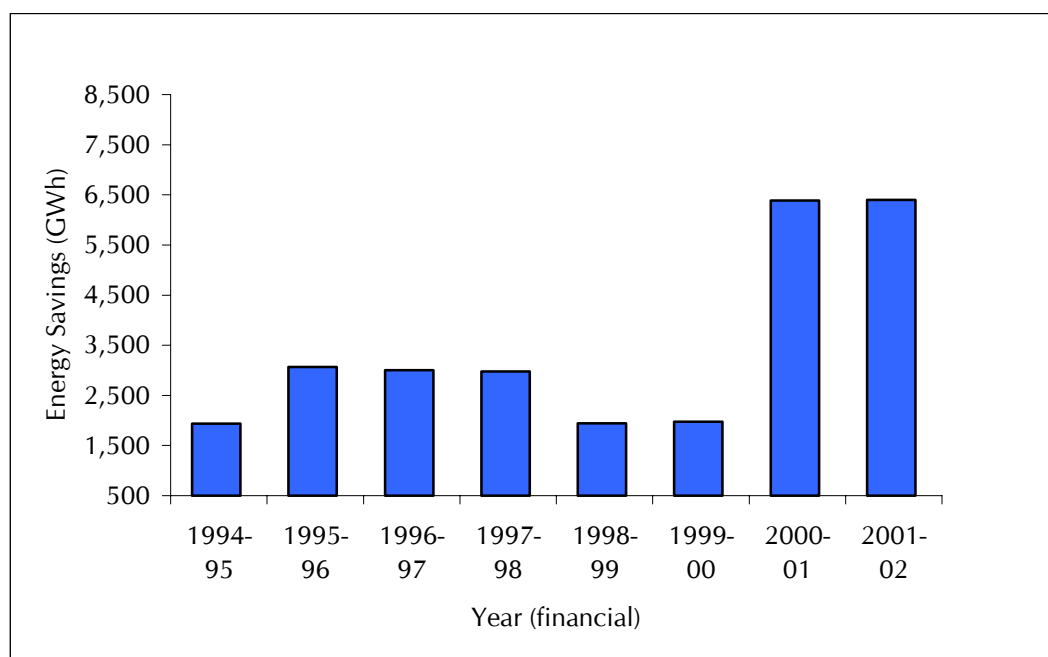
appliances. The popularity of CFLs and insulation can be attributed to the fact that they are more cost-effective than other measures to install in terms of supplier expenditure against energy saved. Although a large number of appliances have been installed, these installations only accounted for a small proportion of the energy savings achieved. The introduction of a gas saving target under EESoP 3 opened up the opportunity for suppliers to install condensing boilers and heating controls. As shown in figure 4.2, these measures accounted for a significant amount of the EESoP 3 gas target.

- 4.14. In addition to the key measure types shown in figure 4.3 above, suppliers have also provided a number of other energy efficiency products to their customers. Among the more popular have been energy efficient luminaires, draught proofing, jug kettles and washing machines to domestic customers and various lighting and insulation measures to non-domestic customers. Some small-scale CHP schemes have also been installed, providing heat and power to approximately 900 dwellings.

Energy savings achieved

- 4.15. The energy savings shown in figure 4.1 are in terms of those accredited to the energy suppliers. The total energy savings generated were greater because the suppliers were accredited with energy savings in proportion to the amount of funding they contributed to a measure. Figure 4.4 below shows the savings arising from the programmes in terms of the total discounted energy savings. The energy savings have been recalculated using the EESoP 3 methodology, allowing the programmes to be compared on an equal basis.

Figure 4.4 Total lifetime discounted energy savings achieved



4.16. The clear trend is an increase in energy savings between EESoP 1 and EESoP 3, where the scale of the programme doubled. The slight decline in EESoP 2 resulted from the reduction in insulation work undertaken compared to EESoP 1. Cavity wall and loft insulation are two of the most cost-effective energy efficiency measures. The fact that fewer of these measures were installed under EESoP 2, due to a lack of suitable properties, is reflected in the annual energy savings achieved.

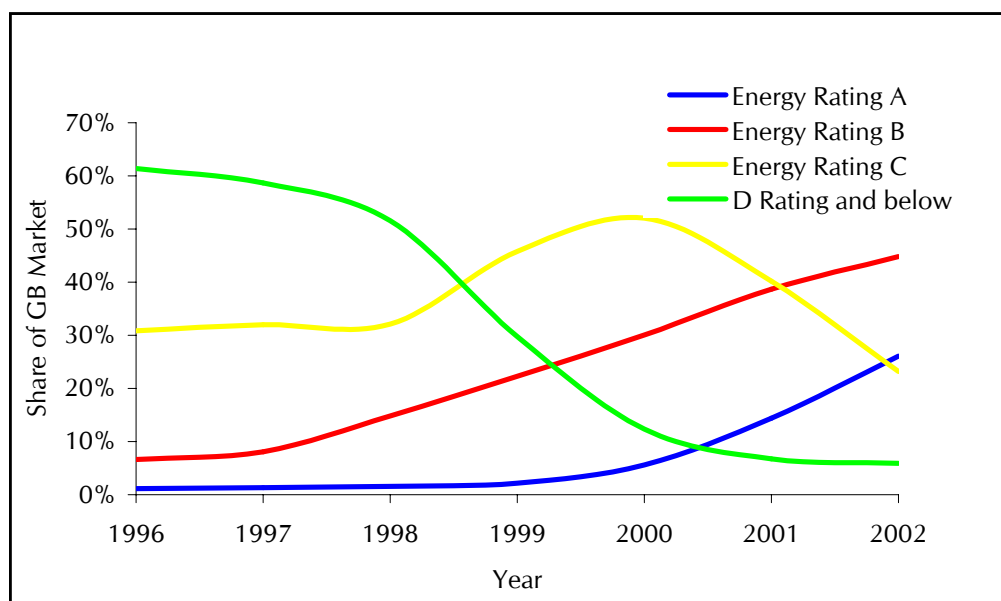
Key measures delivered

4.17. One of the key factors for setting targets for the EESoP programmes was the assumptions of the costs of installing the measures. Information on the cost of installing the measures was collected from suppliers under EESoP 1 and 2. Suppliers were not required to submit measure cost information to Ofgem under EESoP 3. However, a cost disclosure exercise was undertaken towards the end of the programme on behalf of Defra, who used the results when developing the new EEC target. The cost information presented in the following sections uses these data.

Appliances

- 4.18. Although cold appliances were included when setting the EESoP 1 targets, suppliers did not start offering these measures until 1996. At that time, energy efficiency had not been given much consideration by the appliance manufacturers and 'A' rated appliances formed only a very small part of the overall market. The EST worked closely with the manufacturers and retailers of cold appliances to develop a suitable framework for the operation of appliance energy efficiency schemes. Building on a few small-scale pilot schemes, some larger national schemes, managed by EST, were introduced under EESoP 1 in 1996. These were very successful and figure 4.5 shows the impact EESoP appliance schemes have had since then. EESoP 1, 2 and 3 saw respectively 85,000, 130,000 and 160,000 'A' and 'B' rated appliances installed in domestic homes. The market share of 'A' and 'B' rated appliances is on a steep upward curve, while the share of less efficient appliances, class D and below, has dropped sharply. The implementation of the EU Maximum Consumption Directive from September 1999 only allowed the sale of A to C rated cold appliances for the majority of such appliances. This, as well as the market transformation effect of the EESoP programmes, has helped influence appliance manufacturers and retailers to see energy efficiency as a valuable marketing tool to their customers. The EU energy label scheme is to be extended to identify 'A+' categories of appliance.
- 4.19. Some suppliers delivered their EESoP appliance schemes through setting up partnerships with retailers to provide an incentive, perhaps £40-£50, to the customer if they purchased an efficient appliance. The EESoP programmes have also provided significant numbers (some 265,000 between 1997-2002) of appliances to the disadvantaged customer group. These have largely been delivered under the Fridgesavers schemes, a concept the EST introduced in 1997. Fridgesavers helped disadvantaged customers reduce their energy bills by replacing old, damaged inefficient cold appliances with a new 'A' rated one. Eligible customers were able to trade in their old appliance for a new one by contributing around £20 – £25. The energy supplier ensured that the old appliance was removed from the property and destroyed in an appropriate manner, thus ensuring that such an inefficient appliance could not enter the second-hand market.

Figure 4.5 Cold appliance market share by energy label¹¹ (1996 – 2002)



Insulation

- 4.20. Insulation was one of the most popular and cost-effective measures installed by the energy suppliers under the EESoP programmes. The most common insulation measures were cavity wall (257,000 installations), loft (226,000) and hot water tank insulation (65,000). Draughtproofing was installed in around 50,000 homes.
- 4.21. Insulation measures generate the largest benefits for the customer, in terms of reduced energy bills and improved comfort. Because they involve a change in the fabric of the house, insulation measures are also accredited energy savings over a long lifetime, such as 40 years for cavity wall insulation.
- 4.22. Figure 4.6 displays the prices of insulation measures throughout each programme, displayed at 2002 cost equivalents. Energy suppliers were required to ensure that the insulation was installed in line with the relevant British Standards. While the cost of cavity wall insulation and loft insulation has increased slightly over the years, the specification for the measure has changed between the programmes.

¹¹ Source - GfK
A Review of the EESoP programmes
Office of Gas and Electricity Markets
& The Energy Saving Trust

Figure 4.6 The cost of insulation measures

Measure type	EESoP 1	EESoP 2	EESoP 3
Loft insulation	£194	£200	£224
Cavity wall insulation	£223	£219	£261
Tank insulation	£24	£19	£14
Draughtproofing	£104	£89	£96

- 4.23. Prices for loft insulation refer to professional installations. The specification for loft insulation changed throughout the 8 years of the programmes. Change was driven through the ongoing revisions of the Building Regulations, which have required increasing depths of insulation to be installed. While the Building Regulations only specify the requirements for insulation in new build housing, the EESoP programmes have adopted these requirements as best practice. EESoP 1 required 150mm of insulation to be installed. Under EESoP 2 and 3, where insulation was installed, or topped up, to 200mm, from EESoP 2 onwards, an allowance of £25 was included within the target-setting model to pay for loft boarding to provide safe access to tanks.
- 4.24. In EESoP 3, with the introduction of gas-heated homes into the programme, gas safety had to be addressed. When insulating a cavity wall there is a risk that some of the dwelling's ventilation points may become blocked with the insulation material. It was therefore necessary to ensure that the installer carried out the appropriate gas safety check upon completing the insulation work to make sure any existing gas appliances were properly ventilated. A cost allowance of £20 was therefore included in the EESoP 3 target-setting model, and is included in the costs shown in figure 4.6.
- 4.25. Figure 4.7 illustrates the annual energy savings for the most common insulation measures, based on insulation installed in a typical semi-detached house. This table also compares these benefits to the measure costs, which allows the payback period to be calculated.

Figure 4.7 Insulation measures – benefits, costs and payback periods

Measure	Saving (£/yr) ¹²	Installed Cost (£)	Payback (yrs)
Cavity Wall Insulation	£70 - £100	£264	3 – 4
Loft Insulation (new installation)	£80 - £100	£221	2 – 3
Tank Insulation	£10 - £20	£14	1
Draught proofing	£10 - £15	£96	6 - 10

4.26. Of all the cavity walls insulated approximately 95% of installations have been carried out in homes built before 1976. The 1976 change in the Building Regulations required a reduction in the U-value of walls from 1.7 W/m² °C to 1.0 W/m² °C, thus making the property more energy efficient. As a consequence, homes built post 1976 offer reduced potential for energy savings and are therefore not as cost-effective, as illustrated in figure 4.8 below.

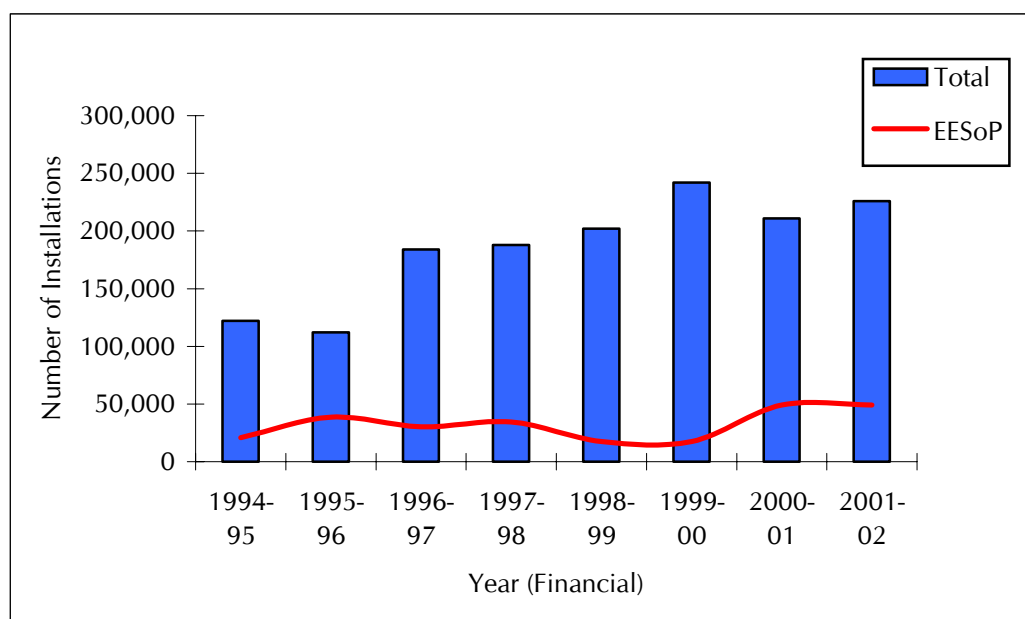
Figure 4.8 Energy savings from cavity wall insulation in pre and post 1976 construction homes

House Type	Discounted energy Saving (kWh/a gas)	Measure Cost (£)	Cost of discounted lifetime energy saving (p/kWh)
Pre 1976 semi	5,380	£264	0.53
Post 1976 semi	3,245	£264	0.88

4.27. The line on figure 4.9 below illustrates the numbers of cavity wall insulation jobs undertaken throughout the EESoP programmes against the total number of jobs undertaken per annum. It shows the steady flow of work under EESoP 1,

followed by the dip in activity under EESoP 2 when it became harder for energy suppliers to locate electrically heated homes that required insulation. The increase in work under EESoP 3, when gas heated homes also became eligible, is clear.

Figure 4.9 Cavity wall insulation installations¹³



- 4.28. Under EESoP 1 and 2, professional installers carried out all installations of insulation. In EESoP 3 there were some trial DIY loft insulation schemes, offering products through mail order. To recognise the fact that these measures were installed by the consumer, additional quality monitoring requirements were placed on suppliers to ensure that the measures had actually been installed correctly. This involved telephone surveys and some home visits. The DIY delivery route has become more popular under the EEC.
- 4.29. Despite the fact that the graph shows an ever-increasing amount of annual activity (which is expected to increase further under the EEC) there is still a lot of remaining potential for cavity wall insulation in Great Britain. Research¹⁴ suggests that some 10million homes have the potential to receive cavity wall insulation.

¹² Annual savings sourced from the Housing Energy Efficiency Best Practice programme GPG 171; 2002

4.30. Of the other insulation measures installed under EESoP the most predominant have been draught proofing and hot water tank insulation. There have been limited numbers of double-glazing installations (typically the high cost of such a measure makes it unattractive to energy suppliers) and also a small number of installations of cavity and loft insulation for non-domestic customers.

Lighting

4.31. Along with insulation, energy efficient lighting has been one of the more popular measures under the EESoP programmes. Since 1994, some 17 million lamps have been provided to customers. The most common lighting measure has been the self-ballasted CFL (compact fluorescent lamp) as a direct replacement for a conventional tungsten GLS (general lighting service) bulb. In addition, 161,000 energy efficient luminaires have been installed. These dedicated light fittings can only hold a CFL and consequently it is not possible to revert to a GLS lamp which ensures CFLs are used throughout the lifetime of the fitting.

4.32. CFLs typically save approximately 75% of the energy consumed by their GLS equivalents. Where a 20W CFL replaced a 100W GLS bulb in a regularly used light fitting (such as the living room) the financial savings would amount to approximately £7 per year. CFLs also have long lifetimes, typically lasting for 12-15,000 hours which could equal as long as 10-12 years. The lifetime financial savings from a single CFL could, therefore, be as much as £80.

Figure 4.10 The cost of CFLs

Measure	EESoP 1	EESoP 2	EESoP 3
CFLs	£7.70	£4.80	£3.70

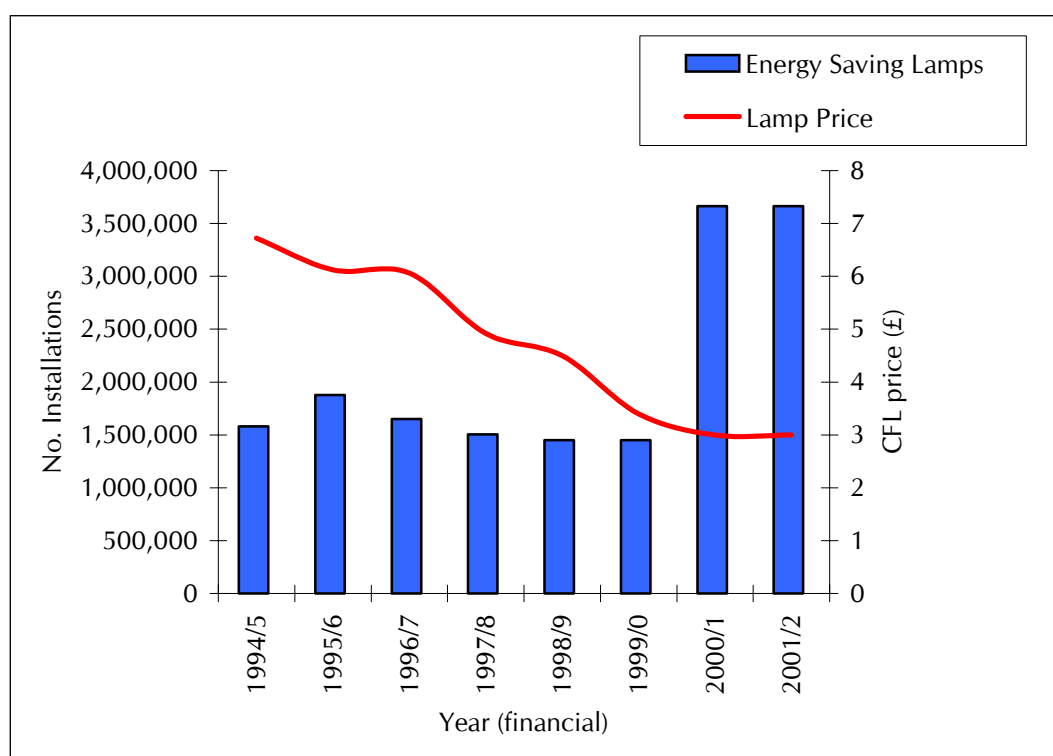
4.33. The increasing scale of lighting schemes under EESoP has helped transform the market by reducing the cost of CFLs. Figure 4.10 above shows how the costs have reduced, using 2002 equivalent prices. The graph below illustrates both the

¹³ Source for total installations data: GfK

¹⁴ House Condition Survey Data and the Domestic Energy Fact File 2003

increase in scale of lighting schemes and the downward trend in costs. While the lamp price represents the price to the energy supplier, these price reductions have also appeared for lamps sold outside of EESoP schemes. Today, good quality CFLs can be purchased in retail outlets for approximately £5.

Figure 4.11 Numbers and prices of CFLs delivered over the EESoP programmes



4.34. Figure 4.11 reflects the fact that a large proportion of the electricity target under the EESoP 3 programme was met by lighting measures, with more than double the annual numbers of lamps installed over previous years. Lighting schemes, particularly mail order, are relatively easy to set up. Therefore CFLs have been particularly popular at the start of each programme to enable suppliers to begin meeting their targets.

4.35. The vast majority of CFLs distributed to customers under the EESoP 1 and 2 programmes were 'stick' type lamps. However, before the start of EESoP 3 energy suppliers reported that their customers wanted to choose from a wider range of lamps because the 'stick' type lamps were considered unsuitable for some light fittings. To take account of this, the EESoP 3 target included an

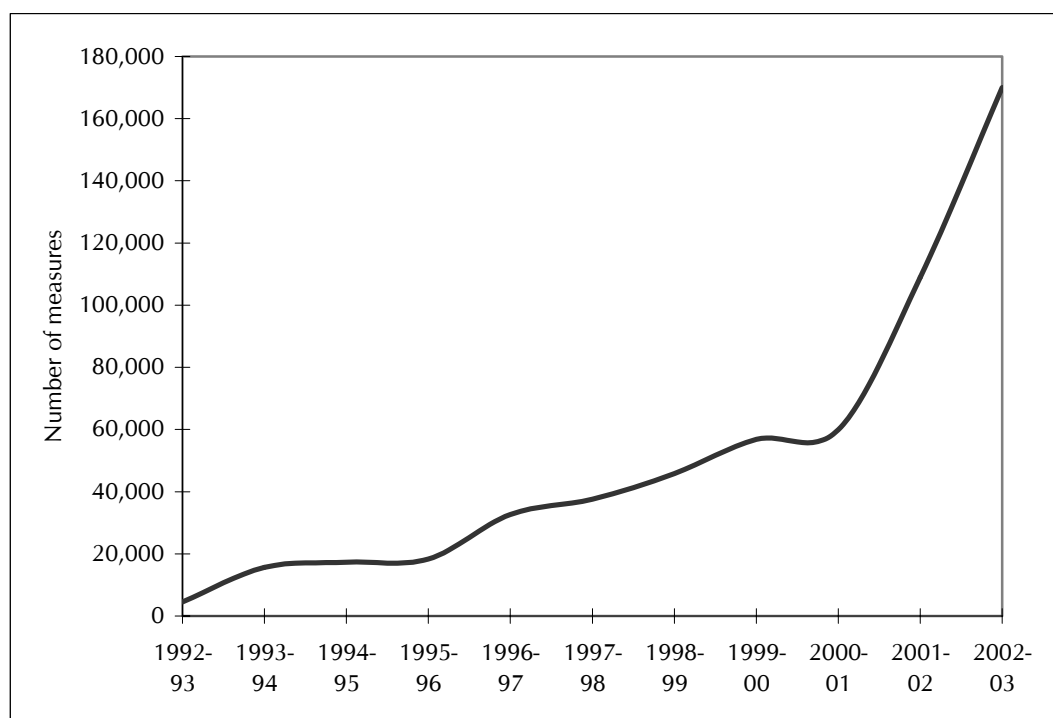
assumption that one-third of the lamps delivered would be of a 'decorative' variety. This type of lamp is typically shorter than 'stick' type lamps and is usually covered with a casing to make it look like a conventional GLS lamp.

- 4.36. The energy suppliers employed a number of delivery routes for their CFL schemes. One of the most popular has been mail order schemes. The number of bulbs available to customers through this route was limited to two per household under EESoP 1 and 2 and six, in general, under EESoP 3. Another popular route was to bulk deliver large numbers of lamps to charities, such as Age Concern. The charity network, usually at no cost to the customer, would then distribute the lamps. Such schemes also ensured that lamps went to disadvantaged customers, thus helping the supplier to achieve the required levels of expenditure on such customer groups. Under the EEC, partnerships with retailers are becoming an important delivery mechanism.

Heating

- 4.37. During EESoP 1 and 2, heating measures were installed in relatively small numbers as only electrically heated homes were eligible and so the scope for such work is limited. Nevertheless, 25,000 electric storage heating control systems were installed. Improving the level of controls on a storage heater can typically save approximately 1,400kWh per annum.
- 4.38. With the introduction of a target for gas suppliers under EESoP 3, the potential for heating measures became much larger. Condensing boilers started to be installed in large numbers (58,000 over the two years), which resulted in the overall sales of condensing boilers increasing as illustrated by figure 4.12 below.

Figure 4.12 Condensing boiler sales 1993 – 2003¹⁵



4.39. Prior to the start of EESoP 3, the market share of condensing boilers remained at roughly 4%. With the introduction of energy suppliers' condensing boiler schemes in 2000 an increase in market share began to occur, reaching 8.5% by the end of the programme.

4.40. Condensing boilers are more expensive to purchase than conventional boilers due to both additional product and installation costs. Figure 4.13 shows the marginal extra cost of a condensing boiler compared with a standard boiler. This marginal cost has decreased, from a value of £450 during EESoP 1 to £165 under EESoP 3. This is due in part to Government-funded programmes and in part to the EESoP programmes which have increased the economies of scale in the production of condensing gas boilers to be installed in GB. The price shown for the period of EESoP 1 relates to the E-factor cash back scheme and that shown for EESoP 2 relates to the Government-funded cashback scheme managed by the EST.

¹⁵ Source – METCOM Society of British Gas Industries
A Review of the EESoP programmes
Office of Gas and Electricity Markets
& The Energy Saving Trust

Figure 4.13 The marginal cost of condensing boilers over standard boilers¹⁶

Period	1994 - 1998	1998 - 2000	EESoP 3, 2000 – 2002
Marginal cost of condensing boilers	£450	£270	£165

4.41. The efficiency of condensing boilers is typically at least 88% compared to the average efficiency of new conventional boilers at the time of EESoP 3 of 75%. This efficiency improvement can save an average household 3,300kWh per annum, a cost saving of £46. In a scheme where the householder funded half of the marginal cost of the boiler, their investment would be repaid in less than two years. The effect of these schemes has helped reduce the marginal cost of condensing boilers to approximately £150¹⁷ today. The proposed changes to the Building Regulations in 2005 will make installing a condensing gas boiler mandatory in both new buildings and for replacements in existing dwellings.

4.42. When installing new boilers, energy suppliers often took the opportunity to upgrade the heating controls. Suppliers generally installed heating controls in packages that represented different combinations of controls, ranging from a basic package of a programmer and room thermostat to a more advanced package that included a programmer, a room/cylinder thermostat, thermostatic radiator valves and intelligent heating controls. These products offer the customer far more control over the operation of their heating systems and generate energy savings. They also allow the boiler to operate nearer its optimum efficiency.

Other measures installed in the domestic sector

4.43. The four sections above cover the vast majority of the measure types installed under the EESoP programmes. Other measures were installed during the course of the programme, although these account for a small proportion of total savings.

¹⁶ Prices are shown as 2002 equivalent

The energy savings generated from these measures were typically less cost effective for the suppliers.

- 4.44. Jug kettles were distributed on quite a large scale, with approximately 253,000 being provided over the eight years. Jug kettles save energy compared with a traditional-style kettle because the water level indicator enables the user to boil as little as one cup of water. Suppliers were required to advise the customer of this feature and encourage them to boil only the necessary amount of water. An energy monitoring exercise, funded by the energy suppliers, demonstrated annual energy savings of approximately 70kWh. Other appliances distributed under EESoP included 'A' rated washing machines and 'A' rated dishwashers.
- 4.45. Combined heat and power (CHP) schemes were also undertaken, although on a very small scale. Approximately 900 properties have benefited from being linked to a CHP plant under schemes that received part funding from energy suppliers.

Measures installed in the non-domestic sector

- 4.46. Assisting non-domestic customers formed only a small part of the EESoP programmes. Several schemes were implemented that provided energy efficient lighting solutions to a variety of users, including farms, schools and churches.
- 4.47. In addition, some work was undertaken with small retailers. Examples of the types of measures provided were 'air-curtains', temperature controllers and insulating blinds that could be drawn across open topped freezers at night. Insulation measures were also offered to some small businesses.

Flexibility projects

- 4.48. Once a supplier had met their EESoP 1 and 2 targets they were given greater flexibility over how they spent any remaining revenue which they had collected. These projects did not necessarily have to provide energy saving measures to customers – they could be projects that either demonstrated the concept of energy efficiency to customers, educated customers about energy efficiency or

projects that looked at utilising innovative new products. Some examples of the schemes run by suppliers were:

- Ground source heat pump installations
- Provision of solar water heating
- Partnering initiatives to combat cold-related illnesses
- Energy awareness training for installers
- Wind turbines

The research and development fund

4.49. Under EESoP 2 and 3, a share of the supplier's funding was ring-fenced for R&D projects. A sub-group of energy suppliers, together with Ofgem, EST and the Electricity Association, was set up to review proposals for funding. The work carried out either evaluated the energy saving properties of new measures (thus allowing suppliers to use those measures in their schemes) or researched barriers to the delivery of energy efficiency measures for suppliers. Examples include:

- research into investigating ways of delivering energy efficiency to customers living in the private rented sector, which is a notoriously difficult sector to work with,
- calculation of energy savings delivered by the provision of a jug kettle,
- calculation of the energy savings arising from substituting microwave oven use for conventional cooker use,
- calculation of the energy savings arising from the installation of heat recovery ventilation units,
- market research aimed at finding new routes for delivery of CFLs.

Energy services schemes

- 4.50. Energy services are encouraged by Government as an effective vehicle for the financing of energy efficiency measures. In EESoP 3 the energy savings accredited to suppliers for the measures they delivered were in relation to their cost contribution. However, energy suppliers could claim 100% of the energy saving, regardless of the cost contribution they made, if the measures were delivered through an energy service route.
- 4.51. A scheme qualified as energy services under EESoP 3 if some or all of the entire up-front costs of the measures were funded by the supplier, in the form of a loan to the customer. This allowed customers who were unwilling to commit finance or a lump sum upfront to participate. The loan was repaid to the supplier either for the full cost of the measures or for just a proportion of the cost, if the supplier provided a subsidy. Energy services give the consumer the opportunity to pay for the measures whilst they benefit from the energy, and therefore the cost, saving.
- 4.52. The minimum time frame for the repayment of the loan was generally twelve months. However, shorter time frames were considered for schemes in which the customer financial benefit outweighed the value of the loan in less than twelve months. In addition, in order to qualify, the financial benefit to the customer needed to be at least equal to the value of the loan repayment.
- 4.53. Several suppliers undertook energy services schemes under EESoP 3, making use of the incentive on offer. Approximately 500,000 CFLs were provided under such schemes, with the customer typically paying for the measures via a deferred charge that was paid through their electricity bill. Approximately 5,000 condensing boilers were also provided, typically being funded through 3 or 5 year loans to the customers.

5. Monitoring and evaluation of energy savings

Introduction

- 5.1. The EESoP programmes have used pre-determined (or 'ex-ante') energy savings for each individual measure to provide a consistent set of data for both the setting of energy supplier targets and for the assessment of the energy saving performance of suppliers' schemes. The expected savings for heating and insulation measures throughout the EESoP programmes were calculated using BREDEM (see Appendix 1). The BREDEM model calculates the energy requirements of domestic dwellings and estimates the likely savings resulting from energy efficiency improvements. It is the best validated and most widely used domestic energy consumption model in the UK. The model, when aggregated over all users, has been shown accurately to predict national domestic energy consumption. In the case of lighting and appliances, the EST has derived energy savings from lighting research and appliance energy labels by liaising with bodies such as the Electricity Association and the Environmental Change Institute at Oxford University throughout the EESoP programmes.
- 5.2. One of the benefits of energy efficiency improvements, particularly insulation which affects the building fabric, is their ability to provide a greater level of comfort (e.g. warmth) for the same amount of energy. Such measures, therefore, typically provide both a reduction in energy consumption and an increase in comfort levels. The target-setting process and performance assessment assumed that disadvantaged households would take 50% of potential savings from insulation measures in improved comfort while other households would take 20%. For non-building fabric measures, only the fitting of energy-efficient lighting (CFLs) was considered to have a small comfort effect of 2.5% through higher illumination levels or increased usage compared to traditional lighting.
- 5.3. Energy monitoring and evaluation projects have been undertaken throughout EESoP in order to compare the actual energy savings achieved against the ex-ante assumptions. It is very important to carry out such an exercise to ensure that the EESoP target-setting model is as accurate as possible and to inform future policy.

Methods used to monitor energy savings

- 5.4. For insulation measures, two separate approaches have been used to monitor the energy savings achieved. First, a large sample of customer meter readings, provided by energy suppliers, was analysed to assess the change in energy consumption before and after the installation of measures. The next step was to make adjustments for differences in reading dates and in the weather over different periods in order to derive “normalised” annual energy consumption before and after installation of measures. The actual saving was then compared with the assumed ex-ante saving, in order to derive the comfort factor. This type of monitoring was completed for electrically heated homes in EESoP1 and gas-heated homes in EESoP3. However, this methodology obviously cannot identify individual reasons for changes in consumption.
- 5.5. In order to find out more about the reasons behind changes in energy consumption, the second monitoring exercise involved detailed household temperature and consumption monitoring, as well as customer questionnaires, for a smaller sample of properties. This type of monitoring was completed in EESoP2 for electrically heated homes.
- 5.6. For lighting measures, physical monitoring of the hours of use for installed CFLs is currently being undertaken in a large sample of homes assisted under EESoP3. This work will evaluate the annual hours of use of CFLs, the average size of GLS bulbs replaced and the comfort factor related to replacement CFLs. This monitoring project is currently on-going although initial results indicate that there is no comfort factor associated with lighting measures.
- 5.7. In order to evaluate energy savings achieved on replacement of boilers, and to determine whether any comfort factor is applicable, physical monitoring of the energy usage before and after the installation of new boilers is being undertaken in homes assisted under EESoP3. This monitoring project is currently on-going.
- 5.8. The importance of insulation measures to the success of EESoP achieving the overall energy saving targets (insulation represented 52 % of overall savings) is reflected in the focus of monitoring completed to date and for which results are available to assess achieved savings from the programmes. The lighting and

boiler installation monitoring results will be finalised in 2004 and made available to Defra to help inform the target-setting process for the EEC post 2005.

Summary of results from the EESoP monitoring

5.9. The evaluation of the monitoring results from the installation of insulation measures can be summarised as follows:

- The monitoring exercises (together with complementary analysis undertaken by the Building Research Establishment using the English House Condition Survey) confirm that the basis of calculating energy consumption and energy savings is basically sound.
- The level of actual energy consumption in gas-heated homes is close to the theoretical energy consumption.
- Applying a comfort factor of 50% in determining the energy savings for disadvantaged customers in gas-heated homes is broadly supported, the results from the study suggested that it was nearer 55%.
- The monitoring exercises did not provide an adequate sample for analysis of non-disadvantaged customers in gas-heated homes and there is insufficient evidence at this stage to make any changes to the comfort factor of 20% applied to this customer group. Further monitoring is necessary to establish the comfort factor for non-disadvantaged customers in gas-heated homes.
- Monitoring of energy consumption in electrically heated homes is complicated by the fact that many use supplementary forms of heating, and the savings in other fuels are not reflected in the monitoring results. However, evidence from EESoP 2 monitoring indicates that they are heated to a lower standard than assumed, both before and after insulation. Consequently the energy savings are much lower than expected.
- The monitoring of internal temperatures in electrically heated homes observed a temperature rise of 0.4°C which only accounted for about a third of the difference between actual and calculated energy savings. This implies that other factors have contributed to the shortfall in savings and that further

monitoring exercises to evaluate the impact of other factors as discussed in Chapter 6 are required.

- It should be recognised that, while actual levels of heating in homes monitored during EESoP may be lower than the levels assumed in the model, the calculation of energy savings is based over the lifetime of the measures, e.g. 40 years for cavity insulation. There is data to suggest that internal temperatures have been rising since at least the 1970s, and all the available evidence suggests they will continue to do so. As a result, while the ex-ante methodology may overstate savings in the early years of a measure's life, it is likely to understate it in future years. It is impossible to be certain what the actual savings over the lifetime of the measures will be, though the monitoring provides some reassurance that the savings are likely to be reasonably close to those assumed in target setting.
- Although initial results indicate that energy efficient lighting has no comfort effect, until the full EESoP3 monitoring results on the annual hours of use of CFLs are available, a comfort factor of 2.5% should be used.

5.10. Further information on the EESoP1 and 2 monitoring is detailed in Energy Savings from Insulation in Electrically Heated Dwelling in the UK. Henderson, G.; Staniaszek, D.; Anderson, B.; and Phillipson, M.; Proceedings of the ECEEE 2003 Summer Study, June 2003. This can be viewed at www.eceee.org/library_links/proceedings/proceedings.lasso.

Carbon savings resulting from EESoP programmes

5.11. As noted above the annual carbon savings resulting from each measure in the programme were calculated using the ex-ante annual energy saving and the application of the comfort factors derived from the monitoring exercises, together with the carbon intensity of the fuel saved. The carbon intensities are consistent with Defra's Environmental Reporting Guidelines.

5.12. The results from the EESoP monitoring exercises, particularly regarding the comfort factors for insulation installed in gas and electrically heated homes, are used in the estimation of annual carbon savings from the EESoP programme in

this section. The carbon savings achieved by EESoP Programme are summarised in figure 5.1.

Figure 5.1. Estimated carbon savings achieved by EESoP Programme, based on monitored results

EESoP Programme	Lifetime Carbon Savings (MtC)	Annual Carbon savings (MtC)
EESoP 1	1.9	0.09
EESoP 2	0.7	0.04
EESoP 3	1.8	0.1
Total	4.4	0.23

5.13. The main factors affecting the carbon savings achieved by each EESoP programme relate to the duration of the programme. The high saving from EESoP1 reflects the fact that it was a 4 year programme compared to EESoP 2 and 3. EESoP3 shows an increase in carbon savings over EESoP 2 due to the inclusion of gas customers and the increase in the scale of the programme.

5.14. The importance of insulation measures in reducing carbon emissions is shown in the following table, figure 5.2, where 56% of the lifetime carbon savings are from insulation and 28% from energy efficient lighting. The impact of heating measures in the programme is mainly through EESoP3 and the inclusion of gas condensing boilers as a measure.

Figure 5.2 Carbon savings achieved per measure type

Total EESoP Programme	Lifetime Carbon Savings (MtC)	Annual Carbon savings (MtC)
Insulation	2.4	0.07
Lighting	1.3	0.12
Heating	0.2	0.01
Appliances	0.3	0.02
Other	0.1	0.01
Total	4.4	0.23

6. The Energy Efficiency Commitment

6.1. When the Gas Act 1986 and Electricity Act 1989 were amended by the Utilities Act 2000, the power was given to the Secretary of State to set overall energy efficiency targets on suppliers. This recognised the success of the previous EESoP schemes as well as the importance of energy efficiency as highlighted in the Government's Climate Change Programme and Fuel Poverty Strategy¹⁸. Ofgem is required to administer this programme through setting the individual targets, assessing scheme proposals and ensuring compliance. Ofgem has taken this administration role in-house and has appointed advisory agents to assist with certain technical issues. Ofgem has produced a report on the delivery of the first year of the EEC on 31 July 2003¹⁹.

Figure 6.1 The EEC programme at a glance

	Energy Efficiency Commitment
Timescales	1 April 2002 – 31 March 2005
Energy saving target	62 TWh fuel standardised
Indicative costs collected	Target based upon spending £3.60 per customer per fuel per annum
Indicative overall cost	Approximately £500 million
Suppliers with a target	All supplier groups with over 15,000 gas and/or electricity domestic customers
Social focus	50% of the target to be met in the priority group
Allowance for R&D or monitoring	None

¹⁸ The UK Fuel Poverty Strategy, November 2001, DEFRA and DTI

¹⁹ This is available at www.ofgem.gov.uk

Key features of the EEC

6.2. The key features of the programme are as follows.

- At least 50% of the total energy savings must be met within the Priority group, i.e. those households receiving certain income related benefits or tax credits.
- The overall target is fuel standardised, suppliers can achieve savings in homes heated by gas, electricity, coal, oil or LPG.
- Suppliers have flexibility over the types of measures that they use to meet their targets.
- Suppliers are not required to spend a fixed amount of money.
- The overall target includes business as usual energy efficiency work, which allows suppliers to tie in with existing schemes. However, every scheme set up by suppliers must clearly demonstrate additionality, i.e. that measures that would not have been sold/installed without the supplier's funding.
- The target has been derived assuming that suppliers will lever in funding from third parties such as social housing providers.
- Suppliers can trade their obligation or energy savings with other suppliers.
- There is an incentive (in terms of an uplift in savings) for suppliers to deliver schemes as an energy service package. The energy service savings eligible for uplift is limited to 10% of each supplier's target. To smooth the transition from EESoP 3 to EEC suppliers were allowed to carry over measures carried out before 1 April 2002. The EEC legislation also allowed suppliers to submit schemes to Ofgem from February 2002, once the targets had been set.

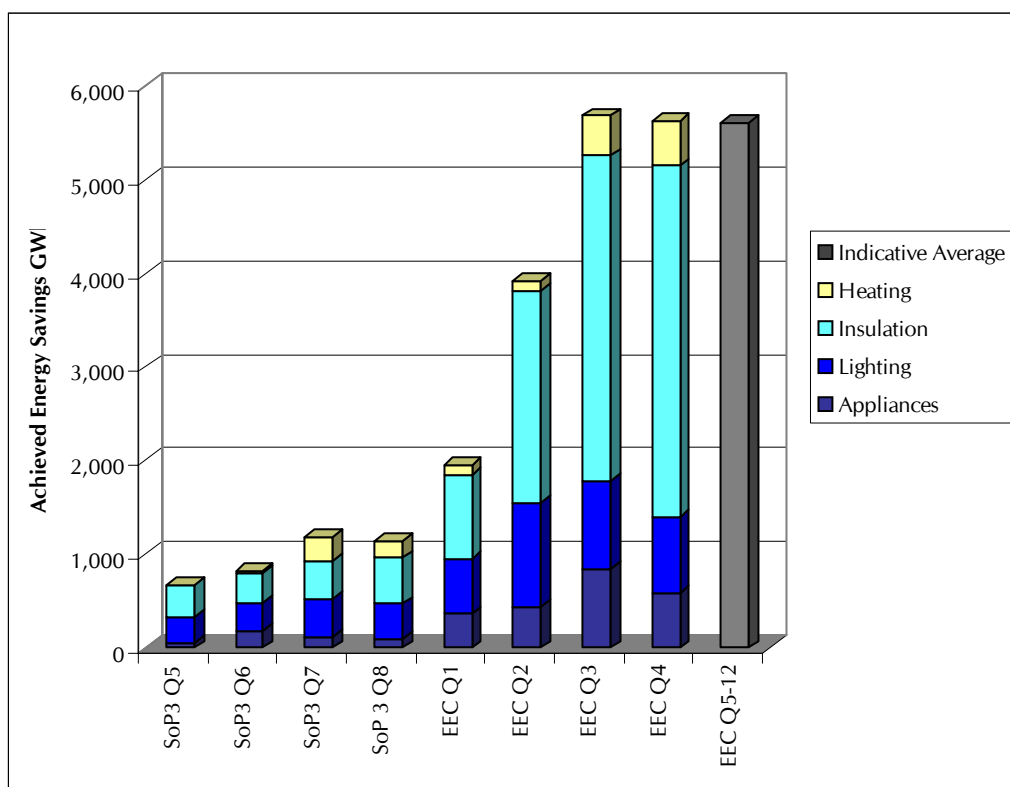
Figure 6.2 Excess EESoP 3 savings carried into the EEC Programme

Energy Saved	Target (GWh)	Accredited against targets (GWh)	Carried over into EEC (GWh)	Total EESoP 3 energy saving (GWh)	Percentage of target over-achieved
Electricity	4,981	5,041	1,220	6,261	25%
Gas	6,144	6,201	1,014	7,215	17%

Summary of progress over the first year

- 6.3. The indicative costs assumed by Defra for the EEC are three times those for EESoP 3. Analysis by the EST shows that this in fact represents a five-fold increase in the volume of energy efficiency work required from suppliers. This takes into account the fact that ‘business as usual’ is included within Defra’s target-setting model.
- 6.4. Over the first year of the EEC, suppliers have achieved over 17,000 GWh of energy savings, equating to just under 30% of the overall target. 60% of these savings have resulted from the installation of insulation measures. Priority group households have benefited from 45% of the overall energy savings over the first year, a slight shortfall against the overall 50% target.
- 6.5. Figure 6.3 shows the energy efficiency measures which have been installed over the last 2 years, i.e. over the last year of EESoP 3 and the first year of the EEC. It illustrates how suppliers have had to increase the scale of their delivery to reflect their new EEC targets. In order to be able to meet their targets, suppliers will need to maintain an average of just over 5TWh of energy savings each quarter for the next 2 years of the EEC. This indicative average is shown on the graph to illustrate the level of delivery which suppliers must maintain.

Figure 6.3 Achieved EESoP and EEC energy savings April 2001 – March 2003



The EEC post 2005

- 6.6. The Government’s White Paper ‘Our Energy Future – creating a low carbon economy’ recognised the importance of energy efficiency in delivering its climate change targets. It suggested that the EEC has a major role to play in curbing emissions from households. It acknowledged that those suppliers with an EEC target have responded positively and are working hard to meet their targets.

- 6.7. The Government plans to consult on expanding the EEC to run from 2005, possibly at twice the current level of activity. The timescale for this has yet to be determined but is expected to run until at least 2008. The current programme is set to achieve carbon savings of 0.4 MtC per annum, equivalent to around a 1%. The White Paper sets out a range of measures which have the potential to deliver carbon savings within the domestic sector of 3.5 MtC per annum by 2010. These measures include higher standards for boilers under the Building Regulations and improvements to standards for household appliances.

7. Lessons learnt from the EESoPs programmes

- 7.1. The introduction of EESoP was the first time energy suppliers had been required to encourage household consumers to use less of the commodity they were trying to sell. The suppliers had little practical experience of working on such programmes. Nor was there any experience elsewhere in the UK of running energy efficiency programmes involving a number of different measures nationwide.
- 7.2. Throughout the EESoP programmes a number of different delivery methodologies were employed. Inevitably some worked better than others and this experience has been taken forward into the EEC. The introduction of the EESoP therefore brought the much-needed experience that has laid the foundations for the much larger EEC.
- 7.3. Lessons have also been taken forward on the development of the policy. Under the EESoP programmes the definition of the disadvantaged group was quite wide and consequently there was some concern that some energy efficiency benefits were not targeted enough on those consumers who were most in need. Under the EEC the group has been more tightly defined to those that are on benefit.
- 7.4. EESoP also developed with the increasingly competitive market. Initially the programme required suppliers to spend a fixed amount of money and meet an energy efficiency target. As competition was introduced into the supply market the focus of the target became much more on the outcome, the energy saving, rather than the inputs, the expenditure. As a consequence of putting the onus on the supplier to determine the amount spent, the EESoP programmes have developed into a market mechanism that delivers energy savings through cost-effective energy efficiency measures.
- 7.5. The increasing scale of the energy efficiency programmes has had an effect on the energy efficiency industry, particularly installers. Each EESoP programme was separate and no mechanisms were put in place regarding the transition of one programme to another. To enable a smooth transition from EESoP 3 to EEC in terms of delivery of measures, the EEC legislation allowed for suppliers to carry over measures carried out before 1 April 2002. This enabled suppliers to

expand their EESoP 3 schemes, or at least continue to operate at the same level rather than scaling down delivery as their EESoP 3 targets were met. This recognised that the transition from EESoP 3 to the EEC was over the winter period when demand for insulation and heating measures is higher. These procedures also enabled the industry to continue operating at the same level of activity rather than have to cope with the stop-start nature of the programmes. The EEC legislation also allowed suppliers to begin submitting schemes to Ofgem before the programme commenced in April 2002. Ofgem was able to assess and approve schemes from February 2002, once the targets had been set.

- 7.6. In spite of the success of the EESoP programmes there is still considerable potential for improvement in the efficiency of household energy consumption. This chapter outlines some of the key lessons learnt from running the energy efficiency programmes and discusses some of the more important issues that will need to be given consideration during the development of future energy efficiency programmes.

Further energy monitoring required

- 7.7. As seen in Chapter 5 energy monitoring was included in the EESoP programmes to ensure that the schemes delivered the energy savings anticipated. While the use of ex-ante savings makes assessing the energy savings from the suppliers schemes relatively straightforward, it does mean that the performance of these schemes is reliant on the assumptions that feed the models on which the energy savings from the measures are derived. Monitoring is therefore required to check whether these assumptions are correct. While the results from the monitoring exercises provide useful answers they also threw up many questions. Given the importance of energy efficiency in the Energy White Paper it is therefore important that this monitoring and evaluation work is taken forward to ensure the robustness of the assumptions that are used in the models to derive the energy savings from the different energy efficiency programmes.
- 7.8. One of the key areas of uncertainty that arose related to the extent to which consumers were heating their homes to the anticipated standards. Clearly the work from the EESoP programmes on electrically heated homes suggests that they are not. However, the results from the monitoring work on the

consumption of disadvantaged consumers in gas-heated homes suggests that the heating standards are much nearer the anticipated level and that, as a consequence, the level of savings are roughly correct. An inspection of the consumption data in the Digest of UK Energy Statistics suggests that, generally, heating standards in gas-heated homes are approaching the assumed level and as a consequence the anticipated energy savings should be realised from measures installed. This top-level analysis needs to be confirmed with an analysis of consumption before and after the installation of insulation in the non-disadvantaged group.

- 7.9. While this work would give useful information about the trends in energy consumption in households before and after installing insulation, it would not explain why there might be a difference between the theoretical answer and the outcome. Consumers generally take the benefits of insulation through a mixture of a reduction in consumption and having a warmer home. Although there is a consumer benefit of having a warmer home the physical consumption pattern of the consumer tends not to be affected as much as anticipated. Having a further insight into the way consumers react to increased insulation in their properties would provide an insight into why the energy savings might in some circumstances be lower than the anticipated level in theory.
- 7.10. This is an area of work that Defra and Ofgem intend to take forward together for future energy efficiency programmes.

Potential for similar programmes in the future

- 7.11. Suppliers have demonstrated that they are capable of delivering energy efficiency programmes both cost effectively and to tight deadlines. Every supplier met its three EESoP targets and in the first two programmes had money to invest in flexibility schemes. Clearly the EESoP programmes demonstrated that energy suppliers were effective at delivering energy efficiency measures.
- 7.12. Throughout the EESoP schemes suppliers worked with social housing providers to provide insulation and heating solutions to their housing stock. This trend has increased significantly in the EEC and suppliers are beginning to develop large-scale alliances to deliver their targets. While this work is delivering important energy efficiency improvements, in a similar way to the capacity for insulation in

electrically heated homes diminished before the start of EESoP 2, there will be a contraction in this market at some time in the longer term.

- 7.13. However, there is considerable potential for energy efficiency improvements in the owner-occupier and the private rented sectors. It appears there are considerable motivational obstacles, especially with the latter group. Many owner-occupiers might not realise the impact they have on the environment and are not aware of, or motivated by, the savings that can be made through improved insulation and higher efficiency boilers.
- 7.14. Future programmes could also be constrained in other ways. The EESoP programmes and the EEC are all about promoting improvements in energy efficiency above what is required by the minimum product standards. As minimum standards rise, there is reduced scope for further improvements in energy efficiency through programmes such as EEC. During the EESoP programmes the suppliers were allowed to promote 'B' rated appliances. The market has now transformed to such an extent that these appliances would not lead to any additional energy saving over the average. In the Energy White Paper the Government confirmed that its aim was to raise standards in the Building Regulations, possibly in 2005, and that the minimum standard for new boilers would be a condensing gas boiler. This will reduce the scope for heating savings through EEC.
- 7.15. It is important to realise that it is not only the changes in the energy efficiency market that will impact on the future development of the energy efficiency schemes. From 2005 electricity generators will be required to partake in the EU Emissions Trading Scheme. This will limit the emissions permissible from eligible sectors including electricity generation. Careful consideration will have to be given to the interaction of a downstream policy such as the EEC and an upstream policy such as the EU Emissions Trading Scheme as decisions are made about the scale of any energy efficiency programme aimed at curbing household electricity consumption.
- 7.16. The Government has stated that its objective is to reduce emissions by 60% by 2050. To achieve this level of reduction will require innovative solutions for the provision of warmth and electrical services to consumers. Already in the EEC we have seen suppliers moving in this direction. Several have set up ground

source heat pump schemes that are targeted at consumers off the gas grid. This will lead to a sharp reduction in the consumption of electricity for heat and hot water by these consumers. In addition, new technologies could be developed for use in energy efficiency programmes. Micro CHP is amongst the most likely and already we have seen developers of these units sign up with major suppliers in Great Britain. Field trials to evaluate the energy, carbon and financial benefits of micro-CHP are due to commence in the autumn.

Appendix 1 Glossary of terms

BREDEM - Building Research Establishment Domestic Energy Model.

CFL - compact fluorescent lamp (energy efficient light bulb).

CHP – Combined Heat and Power.

Comfort factor - the percentage difference between total theoretical 'ex ante' savings and the energy savings achieved. It is very much dependant on the circumstances of occupants within a property at a given time and behavioural factors. This includes 'true comfort' taken by the customer in the form of higher temperatures and also other factors such as lower than expected energy consumption prior to measure installation, underperformance of insulation measures and any other incorrect assumptions in the energy saving calculations.

Disadvantaged customer – a customer on a low income, or who is elderly or living in a rural area.

EEC – Energy Efficiency Commitment.

EESoP – the Energy Efficiency Standards of Performance

Fuel standardisation - is a coefficient which relates to the carbon concentration of each fuel type. These coefficients are set out in the EEC Order and are as follows: coal 0.56, electricity 0.80, gas 0.35, LPG 0.43 and oil 0.46.

GLS Lamp – General Lighting Service bulb

GWh – Gigawatt hour (1 million KWh).

MtC – Million tonnes of Carbon.

NAO – National Audit Office.

PES – A Public Electricity Supplier. There were a total of 14 PESs in Great Britain until the market was deregulated in 1998-9.

Social Housing Provider – a Local Authority or registered Housing Association.

TWh – Terrawatt hour (1000 GWh).

U-Value – Thermal resistance, measured in W/m²K.

Appendix 2 Setting the EESoP targets

2.1. At Offer/Ofgem's request, the EST undertook the development of the targets for the EESoP programmes. At the same time they set up the administrative framework under which they could operate. Once the level of expenditure collected, or assumed to be collected, by the suppliers was determined the EST assessed the types and numbers of energy efficiency measures which could be delivered by suppliers. The targets were determined using this information which was based on a number of assumptions. This work followed extensive discussion and negotiation with various stakeholders, including equipment manufacturers, retailers, trade associations and the energy suppliers. The main factors considered when setting the EESoP targets were:

- Potential for domestic energy efficiency
- Energy savings and lifetimes of the measures
- Costs
- Proportion of disadvantaged customers
- Regional considerations

Potential for domestic energy efficiency

2.2. For each EESoP programme the EST undertook extensive research to determine challenging but achievable targets. In consultation with other interested parties, the EST identified the standard, proven energy efficiency measures which suppliers could offer. It was then necessary to determine the potential for these measures within Great Britain's housing stock. For instance, the number of properties with cavity wall that were not insulated. The House Condition Surveys for each of the devolved countries and the Domestic Energy Fact Files were referenced to establish the potential for the installation of insulation and heating measures. To determine the potential for other measures, such as appliances and lighting, the EST undertook several studies²⁰.

²⁰ Energy Efficiency from Domestic appliances to 2010; Energy efficiency and Environmental Benefits to

Energy savings and lifetimes of the measures

- 2.3 Once the main energy efficiency measures had been identified it was necessary to determine the energy saving they could achieve. The energy saving per measure utilised was on the basis of an agreed “*ex-ante*” (or pre-determined) figure. BREDEM²¹ has been the main source for assessing energy savings from insulation measures. Energy saving values for lighting and appliances were primarily derived from product information, backed up with information on usage levels from monitoring exercises. The EESoP targets were based on the energy savings a product can achieve over its lifetime. For EESoP 1 & 2, the maximum lifetime applied was 15 years. This was a deliberately conservative estimate as there were no established lifetimes for each of the main measure types at the time. For EESoP 3, longer lifetimes were used, based on Government figures²². A lifetime of 40 years was assumed for cavity wall insulation as it becomes part of the fabric of the building. This also brought EESoP 3 in line with the Government’s Climate Change Programme, which intended to assess benefits over the full lifetime of a measure.
- 2.4 In terms of the specification of the measures installed, suppliers were encouraged to follow best practice guidance, such as the Building Regulations, and to meet the relevant British Standards. As mentioned in section 4, this particularly affected loft insulation where the specified optimum depth increased from 150mm to 200mm between EESoP 1 & 2 (it increased again to 250mm for EEC).

Costs

- 2.5 For EESoP 1 the direct costs of measures (including installation costs for insulation and heating measures) were established using a broad range of sources such as the installation industry, government agencies and the EST’s own data. When setting the EESoP 2 and 3 targets, measure costs were largely based

2010; Small Scale Multi-Residential CHP and Environmental Benefits to 2010; New Build Housing and Energy Efficiency to 2010. [Energy Saving Trust](#); 1997-8

²¹ BREDEM calculates the energy requirements of domestic dwellings and estimates the likely savings resulting from energy efficiency improvements. It is the best validated and most widely used energy model in the UK.

²² HAPM Component Life Manual, E & F Spon, first published 1992.

on those previously paid by the suppliers. Adjustments were then made for inflation, any new trends in the marketplace or any change to the specification of the measures. For example, the impact of the Building Regulations on loft and cavity wall insulation, as set out in Section 4.

- 2.6. Assumptions were made with regard how much of the direct cost of measures would be met by customers and third parties, such as Local Authorities. The EST developed an incentive mechanism that encouraged suppliers to secure funding from other parties - the more the supplier was able to leverage in third party funds, the greater the incentive. In all cases, though, suppliers were still required to make a suitable contribution toward the cost of measures, in order to demonstrate that the measures installed were additional to 'business as usual', i.e. that they would have not been installed without the supplier's contribution.
- 2.7. The relative cost effectiveness of measures was derived from the energy saving per measure, its cost, as well as the lifetime of the measure. It shows, alongside the potential, the likely mix of measures that suppliers may use to meet their targets.
- 2.8. Assumptions were also made with regard how much suppliers would need to spend on supporting activities such as scheme development, marketing, administration, monitoring, evaluation and reporting. For EESoP 1 these so called 'indirect' costs were factored in at around 21% of the overall costs. This assumption was based on the EST's own experience of running energy efficiency programmes, consultation with the suppliers and also experience from the USA, in particular the work of the Oak Ridge National Laboratory. Actual indirect costs incurred during EESoP 1 and 2 averaged approximately 22.5% of total expenditure. However, with the larger economies of scale of EESoP 3 the EST recommended that the level of indirect costs be reduced. An average figure of 21% of the indicative costs was assumed when setting the EESoP 3 targets, with the exact level being calculated for each supplier based on their customer numbers.
- 2.9. For EESoP 3, the overall target was apportioned to each supplier in relation to their customer numbers. A purchasing efficiency factor was introduced to reflect the variations in size of the energy suppliers, ranging from less than 100,000 domestic customers to in excess of 15 million customers.

Proportion of disadvantaged customers

2.10. Throughout the EESoP programmes suppliers were required to target a proportion of their activity at disadvantaged customers. This was factored in to the target setting process. Measures offered to disadvantaged customers generally require a higher level of cost contribution from the supplier because the customers have no capital to invest in energy efficiency. However, consideration was given to measures which could be provided with social housing providers as the cost was assumed to be shared by them and the supplier. The number of disadvantaged recipients, private householders and social housing, had therefore to be factored into the target as it has implications for the size of the target which can be achieved for the expenditure indicated.

Regional considerations

2.11. EESoP 1 was developed initially for the suppliers operating in defined regions in England and Wales. Targets for those suppliers were based on a standard set of criteria, with only a few variations for some suppliers based on an assessment of regional costs. Targets for Scotland were introduced in 1995 and contained Scotland-specific assumptions with regard to both the potential for energy efficiency in Scotland and the level of savings generated by the measures.

2.12. The delivery of EESoP 1 demonstrated that the potential for some measures differed greatly between regions – for example the potential for insulation in the Southwest is far larger than in London. Therefore, for EESoP 2, each supplier had a target based on the potential for different energy efficiency measures in their region.

2.13. When EESoP 3 was introduced in 2000, both the electricity and gas supply markets had been fully opened to competition. Suppliers were therefore able to operate nationally and supply and offer energy efficiency measures, to any household within Great Britain. The EESoP 3 targets were apportioned to suppliers in relation to their customer numbers.

Appendix 3 EESoP 1

3.1. These figures are presented in the original EESoP 1 reporting format.

Figure A3.1 EESoP 1 overall expenditure on schemes

Approved schemes	No.	Total supplier cost (£)	%
National	22	15,282,000	16
Regional	474	81,110,800	84
Total	496	96,392,800²³	100

Figure A3.2 EESoP 1 supplier expenditure by customer type, tenure and sector

Sector	Supplier cost	%
Domestic	91,287,430	95
Of which: Disadvantaged customers	60,980,724	66.80
Non-Disadvantaged customers	30,306,706	33.20
Of which: Owner occupier	49,270,183	53.97
Social housing	38,458,828	42.13
Private rented	3,558,419	3.90
Of which: Rural	6,800,841	7.45
Disabled	1,244,542	1.36
Pensioners	11,772,258	12.90
Non-Domestic	5,105,370	5
Total	96,392,800	100

²³ This figure excludes the flexibility schemes set up by suppliers which accounts for an additional £4.7 million of supplier expenditure.

Figure A3.3 EESoP 1 number of installations by property type

Property type	Cavity wall insulation	Loft insulation	Draught proofing	Other insulation	Heating controls	Total	%
Bungalow	12,390	8,062	3,650	4,547	2,296	30,945	10
Flat	24,781	16,123	7,300	9,093	4,592	61,889	20
Detached house	17,346	11,286	5,110	6,365	3,214	43,321	14
Semi-Detached house	43,366	28,216	12,775	15,913	8,035	108,305	35
Terraced house	26,020	16,929	7,664	9,548	4,821	64,982	21
Total	123,903	80,616	36,499	45,466	22,958	309,442	100

Figure A3.4 EESoP 1 number of measures and their energy savings

Measure	Number of installations	Total discounted energy savings (GWh)	Total supplier accredited lifetime energy saving (GWh)	% of accredited savings
Domestic CFLs	6,612,300	3,029	2,193	32
Dedicated luminaires	98,000	3	3	0.04
Cavity Wall Insulation	123,900	2,449	2,234	33
Loft insulation	80,600	1,328	1,245	18
Tank insulation	39,800	223	210	3
Draught proofing	36,500	123	116	2
Heating controls	23,000	124	110	2
Other domestic insulation	2,200	47	41	1
CHP (no. of properties)	433	39	31	0.46
Double glazing	3,400	20	16	0.24
Refrigeration	85,200	262	239	4
Kettles	2,000	1	1	0.01
Non-domestic measures	62,800	442	366	5
Total	7,170,100	8,090	6,805	100

Figure A3.5 EESoP 1 environmental impact

Emission	Lifetime savings (tonnes)	Average annual saving (tonnes)	Policy cost* (£ supplier spend per lifetime saving)
Carbon	1,957,600	95,226	50
CO ₂	7,244,800	355,100	13

* Note that these figures significantly under state the benefits as they do not take account of the energy saving benefits that accrue to the customer.

Figure A3.6 EESoP 1 indicators

Indicators	EESoP 1	
	Completed schemes 1994 - 1998	Assumptions when target set in 1994
Supplier accredited savings (GWh)	6,805	6,103
Supplier proportion of total cost (%)	72%	58%
Supplier proportion of total savings (%)	84%	72%
Disadvantaged customers (% of supplier domestic cost)	66%	> 35%
Domestic (% of supplier total costs)	95%	93%
Indirect costs (% of supplier total costs)	19%	23%

Appendix 4 EESoP 2 data

4.1. These figures are presented in the original EESoP 2 reporting format.

Figure A4.1 EESoP 2 overall expenditure on schemes

Approved schemes	No.	Total supplier cost (£)	%
National	9	9,486,400	21
Regional	159	35,075,300	79
Total	168	44,561,700²⁴	100

Figure A4.2 EESoP 2 supplier expenditure by customer type, tenure and sector

Sector	Supplier cost	%
Domestic	43,037,700	97
Of which: Disadvantaged customers	29,754,200	69
Non-Disadvantaged customers	13,283,500	31
Of which: Owner occupier	26,253,000	61
Social housing	15,923,900	37
Private rented	860,754	2
Of which: Rural	5,244,500	12
Disabled	955,500	2
Pensioners	6,156,700	14
Non-Domestic	1,524,000	3
Total	44,561,700	100

²⁴ This figure excludes the flexibility schemes set up by suppliers which accounts for an additional £3.6 million of supplier expenditure.

Figure A4.3 EESoP 2 number of installations by property type

Property type	Cavity wall insulation	Loft insulation	Draught proofing	Tank insulation	Other insulation	Heating controls	Total	%
Bungalow	5,699	8,582	1,253	1,799	0	145	17,478	20
Flat	11,504	5,756	1,590	2,183	105	1,102	22,240	25
Detached house	1,407	2,560	547	523	0	41	5,078	6
Semi-Detached house	8,747	9,197	1,498	2,251	0	345	22,038	25
Terraced house	7,760	9,085	1,553	2,130	126	618	21,272	24
Total	35,117	35,180	6,441	8,886	231	2,251	88,106	100

Figure A4.4 EESoP 2 number of measures and their energy savings

Measure	Number of installations	Total discounted energy savings (GWh)	Total supplier accredited lifetime energy saving (GWh)	% of accredited savings
Domestic CFLs	2,898,500	1,563	1,368	44.8
Dedicated luminaires	8,800	16	14	0.5
Cavity wall insulation	35,100	605	564	18.5
Loft insulation	35,200	418	398	13.0
Draught proofing	6,400	17	16	0.5
Tank insulation	8,900	46	44	1.4
Heating controls	2,300	13	12	0.4
Double glazing	200	1	0	0.0
CHP (no. properties)	300	28	22	0.7
Refrigeration	131,900	497	459	15.0
Washing machines / Dishwashers	5,100	6	6	0.2
Kettles	28,900	12	12	0.4
Non-domestic CFLs	50,400	64	55	1.8
Other non-domestic lighting	73,000	81	72	2.4
Non-domestic insulation	15,600	8	8	0.3
Non-domestic heating controls	90	1	1	0.0
Total	3,300,690	3,376	3,052	100

Figure A4.5 EESoP 2 environmental impact

Emission	Lifetime savings (tonnes)	Average annual saving (tonnes)	Policy cost* (£ supplier spend per lifetime saving)
Carbon	677,500	39,800	66
CO ₂	2,526,100	148,500	18

* Note that these figures significantly under state the benefits as they do not take account of the energy saving benefits that accrue to the customer.

Figure A4.6 EESoP 2 indicators

Indicators	EESoP 2	
	Completed schemes 1998 - 2000	Assumptions when target set in 1998
Supplier accredited savings (GWh)	3,052	2,713
Supplier proportion of total cost (%)	84%	79%
Supplier proportion of total savings (%)	85%	86%
Disadvantaged customers (% of supplier domestic cost)	69%	65%
Domestic (% of supplier total costs)	97%	98%
Indirect costs (% of supplier total costs)	23%	25%

Appendix 5 EESoP 3 data

5.1. These figures are presented in the original EESoP 3 reporting format. There are a few remaining scheme completion reports yet to be submitted by suppliers, therefore these numbers may be subject to minor revision.

Figure A5.1 EESoP 3 number of installations by property type

Property type	Cavity wall insulation			Loft insulation			Draught proofing			Tank insulation		
	Elec	Gas	Total	Elec	Gas	Total	Elec	Gas	Total	Elec	Gas	Total
Bungalow	3,523	12,850	16,373	4,265	9,500	13,765	122	410	532	925	1,688	2,612
Flat	6,157	8,843	15,000	2,445	4,995	7,440	224	553	777	1,032	1,067	2,099
Detached house	991	7,938	8,929	1,823	4,198	6,021	71	144	215	337	911	1,248
Semi-detached house	4,579	27,083	31,662	5,410	18,740	24,150	143	1,261	1,404	1,185	3,491	4,676
Terraced house	4,338	21,904	26,242	4,733	54,100	58,833	102	1,582	1,684	1,072	5,753	6,826
Total	19,588	78,618	98,206	18,676	91,533	110,209	662	3,950	4,612	4,551	12,910	17,461

Property type	Heating controls			Boiler replacement			Total heating and insulation	%
	Elec	Gas	Total	Elec	Gas	Total		
Bungalow	0	7,446	7,446	0	5,026	5,026	45,754	13.4
Flat	0	3,520	3,520	0	4,826	4,826	33,662	9.9
Detached house	0	12,884	12,884	0	8,898	8,898	38,195	11.2
Semi-detached house	0	19,519	19,519	0	19,545	19,545	100,956	29.0
Terraced house	5	9,688	9,693	0	19,604	19,604	122,882	36.0
Total	5	53,057	53,062	0	57,899	57,899	341,449	100

Figure A5.2 EESoP 3 number of measures and their energy savings

Measure	Number of installations			Total discounted energy savings (GWh)			Total supplier accredited lifetime energy savings (GWh)			Percentage of accredited energy savings (%)		
	Elec	Gas	Total	Elec	Gas	Total	Elec	Gas	Total	Elec	Gas	Total
Domestic CFLs	7,372,142	0	7,372,142	3,551	0	3,551	3,112	0	3,112	61.7	0.0	27.7
Dedicated luminaires	54,507	0	54,507	49	0	49	47	0	47	0.9	0.0	0.4
Cavity wall insulation	19,588	78,618	98,206	607	3,076	3,683	570	2,687	3,257	11.3	43.3	29.0
Loft insulation	18,676	91,533	110,209	489	1,818	2,307	456	1,546	2,002	9.0	24.9	17.8
Draught proofing	662	3,950	4,612	1	10	11	1	9	10	0.0	0.1	0.1
Tank insulation	4,551	12,910	17,461	19	85	104	18	74	92	0.4	1.2	0.8
Refrigeration	159,412	0	159,412	775	0	775	729	0	729	14.5	0.0	6.5
Boiler replacement	0	57,899	57,899	0	1,756	1,756	0	1,533	1,533	0.0	24.7	13.6
Heating controls	5	53,057	53,062	0.03	431	431	0.02	349	349	0.0	5.6	3.1
CHP (number of properties)	144	0	144	10	0	10	7	0	7	0.1	0.0	0.1
Kettles	221,773	0	221,773	99	0	99	97	0	97	1.9	0.0	0.9
Other	135	4,623	4,758	6	3	9	5	3	8	0.1	0.1	0.1
Total	7,851,595	302,590	8,154,185	5,606	7,179	12,776	5,041	6,201	11,234	100	100	100

Figure A5.3 EESoP 3 environmental impact

Emission	Lifetime saving (tonnes)			Average annual saving (tonnes)		
	Elec	Gas	Total	Elec	Gas	Total
Carbon	934,100	835,900	1,770,000	74,400	29,900	104,300
CO ₂	3,483,200	3,059,600	6,542,800	277,300	109,400	386,700

