



Department for
Business, Energy
& Industrial Strategy

EVALUATION OF THE ENERGY SAVINGS OPPORTUNITY SCHEME

Interim process and early impact evaluation
report

October 2017

This document is available in large print, audio and braille on request. Please email enquiries@beis.gov.uk with the version you require.

EVALUATION OF THE ENERGY SAVINGS OPPORTUNITY SCHEME

Interim process and early impact evaluation report

© Crown copyright 2017

You may re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence.

To view this licence, visit www.nationalarchives.gov.uk/doc/open-government-licence/version/3/ or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or email: psi@nationalarchives.gsi.gov.uk.

Any enquiries regarding this publication should be sent to us at enquiries@beis.gov.uk.

This publication is available for download at www.gov.uk/government/publications.

Contents

Executive Summary	3
Overview of ESOS	3
Evaluation background, aims and approach	3
Achievement of policy objectives	5
Summary of organisational and market response to ESOS	6
Influence and impact of ESOS to date	7
1.0 Introduction	8
1.1 Background to ESOS	8
1.2 Evaluation background, aims and approach	9
1.3 Limitations to the evaluation	11
1.4 Terminology used in this report	12
1.5 Structure of this report	12
2.0 Overview of ESOS and theoretical framework	14
2.1 Aims and Objectives	14
2.2 Rationale for intervention	14
2.3 Theoretical Framework	15
2.4 Wider policy landscape and uncertainties	19
3.0 Initial organisational response	21
3.1 Awareness raising activity	22
3.2 Notification of scheme compliance	23
4.0 Assessor Market Response	30
4.1 Creation of a sufficient supply and quality of assessor market	30
4.2 Early signs of ongoing market effect for assessor services	36
5.0 Influence and impact of ESOS on organisational energy efficiency	38
5.1 Context for assessing influence and impact of ESOS	39
5.2 Influence of ESOS on energy efficiency policy and priorities	42
5.3 Implementation of savings opportunities and attribution to ESOS	45
6.0 Costs of ESOS compliance	53

6.1 Internal costs of compliance _____	53
6.2 Minimisation of burden _____	57
7.0 Conclusions _____	61
7.1 Minimisation of Compliance Costs _____	61
7.2 Provide Information on Energy Savings _____	62
7.3 Stimulate Take Up of Energy Efficiency Measures _____	62
7.4 Maximise Synergies with Existing Policies _____	63

Executive Summary

Ipsos MORI and University College London (UCL) were commissioned by the Department for Energy and Climate Change (DECC)¹ in April 2015 to undertake a process evaluation of the Energy Savings Opportunity Scheme (ESOS) and to design, and collect baseline evidence for, a future longer-term impact evaluation. This report presents findings from the process evaluation and a discussion of evidence relating to early signals of impact².

Overview of ESOS

Article 8 (4-6) of the EU Energy Efficiency Directive (2012/27/EU) requires all large enterprises (or smaller organisations that are part of a large undertaking) to carry out audits or a specified equivalent or exemption (such as ISO 50001) of the energy used by their buildings, industrial processes, and transport to identify cost-effective energy saving measures by 5 December 2015 and at least every four years thereafter. ESOS was developed by DECC (now BEIS) to implement the Directive in the UK. Obligated organisations were required to notify compliance with the scheme administrator³, though implementation of the energy saving measures identified is voluntary.

Evaluation background, aims and approach

This evaluation of ESOS sought to answer six high-level questions:

Key Question (KQ)1: How have large organisations reacted to ESOS?

KQ2: How has the assessor market responded?

KQ3: How is ESOS influencing organisational energy efficiency policy and practice?

¹ The Department for Business, Energy and Industrial Strategy (BEIS) as of July 2016

² A separate report presents the feasibility study into the design of a full impact evaluation, available on this webpage: <https://www.gov.uk/government/publications/energy-savings-opportunity-scheme-esos-evaluation-of-the-scheme>

³ The Environment Agency is the scheme administrator for the whole of the UK. Responsibility for compliance and enforcement rests with the Environment Agency in England and the equivalent devolved agencies i.e. Scottish Environment Protection Agency, Northern Ireland Environment Agency, Natural Resources Wales; and the Secretary of State for Business Energy and Industrial Strategy (for organisations with wholly or mainly offshore activities).

KQ4: Has ESOS been implemented in a way that has avoided unnecessary burden and cost?

KQ5: What impact has ESOS had on organisations?

KQ6: How have the benefits of energy efficiency been realised by large undertakings?

These evaluation questions have been assessed through the following activities:

- **Familiarisation interviews with stakeholders** at BEIS and the Environment Agency, other involved government departments, and devolved administrations,
- **Management information review** of key policy and operational documents, applicant guidance documents and related research and evaluation reports, including a separate non-domestic business tracker survey by IFF Research⁴,
- **Logic model development**, including a descriptive Theory of Change for ESOS;
- **Qualitative interviews** with 40 ESOS obligated organisations (25 pre-compliance, in November 2015 and 15 post-compliance in March 2016) and 10 assessor market firms (including energy audit service firms, trade bodies and register owners),
- A **representative quantitative telephone survey** of 871 ESOS-obligated organisations⁵.
- **In-depth case-studies with 10 organisations who had notified their compliance** to gain a detailed understanding of the processes involved in ESOS and to explore initial impacts.

Further information on these activities is included in the technical annexes to this report⁶.

⁴ DECC non-SME Tracker survey, results reported in Business Awareness and Uptake of Energy Audits <https://www.gov.uk/government/publications/business-awareness-and-uptake-of-energy-audits-research>.

⁵ The participants in the survey comprised: 801 organisations who had notified compliance, 20 organisations who had notified that they 'intended to comply' and 50 organisations who had not notified compliance by 25 August 2016. Organisations in this last grouping were at this point "suspected non-notifiers" but it is possible that some of these organisations may have later been deemed out-of-scope of ESOS following checks into their eligibility criteria by the scheme administrator. Note that obligated organisations may have also notified that they did not qualify for ESOS but this group were not sampled for the survey.

⁶ Evaluation of ESOS: Interim process and early impact evaluation report: Technical Annexes. <https://www.gov.uk/government/publications/energy-savings-opportunity-scheme-esos-evaluation-of-the-scheme>

Impact evaluation scoping work (including identification of, and feasibility testing and linking of secondary datasets) was also conducted to inform recommendations for a longer-term evaluation of ESOS' outcomes and impacts (including an exploration of the longer-term benefits of compliance). This is reported on separately and focuses on planning an approach to answering key evaluation questions 5 and 6 in particular.

Achievement of policy objectives

The main conclusions from this process evaluation of ESOS, examining how far the policy met its four core policy objectives, are as follows:

- **Minimisation of compliance costs:** The costs of compliance were in line with those anticipated in DECC's initial Impact Assessment⁷ ⁸. However, many organisations delayed their compliance activity until close to the deadline, resulting in higher costs for assessor services than may have been the case if demand had been smoothed over the course of 2015.
- **Provide information on energy savings:** In the main, the information acquired through the ESOS process was thought to be of a satisfactory standard (over 70% of obligated parties were satisfied with their report and trusted the recommendations made). However, levels of engagement with this information varied by organisation, and cultural barriers regarding board level engagement in energy efficiency issues were reportedly challenging to overcome.
- **Stimulate take up of energy efficiency measures:** Four in five (79%) complier⁹ organisations (i.e. those who had submitted a compliance or 'intend to comply' notice) reported some form of energy efficiency improvement in the 18 months prior to mid-2016. In turn, a third (33%) of these organisations reported ESOS to have been influential in their decision to implement at least one of their improvements. A similar proportion of compliers (including those who intended to comply) who owned or leased vehicles reported implementing fuel efficiency improvements within this same time period (82%). Around one in five (22%) of these went on to attribute at least one of the fuel efficiency improvements to the influence of ESOS.

⁷ Organisations reported spending 15 days on average on ESOS compliance and 80% incurred additional external costs - on average between £6,150 and £14,388.

⁸ Impact Assessment: Energy Savings Opportunity Scheme, Department for Energy and Climate Change and Department for Transport, 2014. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/323116/ESOS_Impact_Assessment_FINAL.pdf

⁹ For the purposes of this report, the term 'complier' is used, which denotes an organisation that submitted an ESOS compliance notification of compliance with the scheme, including those that stated 'intend to comply'.

ESOS influenced organisations in two main ways: First by confirming or validating (e.g. as part of an energy audit) previously recognised energy or fuel efficiency opportunities (allowing some teams to compete more effectively for investment). Secondly, by prompting the collection and analysis of energy or fuel information in sites or businesses that had not previously been examined (particularly those with complex or multiple site operations).

- **Maximise synergies with existing policies:** In general, having previously undertaken energy data collection and reporting for other energy efficiency policies (for example, for the CRC Energy Efficiency scheme) reduced the perception of burden from ESOS (although recordings of time and costs spent were no lower for these organisations. who would generally have higher levels of energy use than those who did no previous reporting). However, in line with expectations in the initial Impact Assessment¹⁰, organisations with experience of other schemes were less likely to identify any increase in interest in energy efficiency at either organisational or board-level to result from ESOS.

Summary of organisational and market response to ESOS

Initial organisational response to ESOS: Although awareness was high amongst obligated organisations¹¹, the ESOS compliance process was characterised by late initiation and commissioning of compliance activity by many obligated organisations. Environment Agency notification data shows a significant spike in compliance notifications around one month prior to the 5 December 2015 deadline. Delayed notification mainly stemmed from the level of priority given to ESOS by organisations or longer decision-making around how to comply in the case of organisations with structural complexities. The scheme was primarily perceived as a regulatory requirement, though there were examples of high energy-use organisations, or those providing services to the public sector, that were keen to derive value from compliance. In some cases, ESOS motivated organisations to seek ISO 50001 certification.

By 5 December 2015, the Scheme Administrator, the Environment Agency, had received approximately: 4,000 compliance notifications, 2,500 intent to comply late notifications, and 400 'do not qualify' notifications. As at July 2017, the latest data available, 6,870 compliance notifications had been received¹². Obligated organisations mainly reached compliance through energy audits (c. 83%). While the notification process was reportedly

¹⁰ See page 25 of the original impact assessment, *ibid*.

¹¹ 90 percent were aware of the requirements six months ahead of the compliance deadline according to the DECC non-SME Tracker survey conducted during 2015.

¹² It is estimated that around 6,300 Ultimate Parent Groups are obliged to participate in ESOS. The exact number of Ultimate Parent Groups is subject to change as the scheme administrator conducts compliance audits and continues to bring organisations into compliance.

straightforward, some notifying organisations made errors when recording their subsidiaries which might be a sign that there was some misinterpretation of the information requested in the notification or wider challenges in defining organisational structures in the context of the scheme requirements.

Assessor market response: Analysis of assessor registers and the qualitative research indicates that there was a sufficient supply of high quality accredited assessors was in place to meet the ESOS requirements, with over 900 assessors registered. However, the timing of compliance activity led to increased prices for assessor services, and a fall in perceived value for money. Initial checks undertaken by the Environment Agency indicated that ESOS audits undertaken by or on behalf of obligated organisations were found to be broadly compliant with the scheme requirements, although some required remedial action.

Influence and impact of ESOS to date

ESOS influence and impact on organisational energy efficiency: ESOS was reported to have led to an increase in interest (including at board-level) in energy efficiency by 40% of compliant organisations (including those who intended to comply). Similar changes in priority levels were also reported by non-notifiers. Since early 2015 a third of compliers surveyed had introduced or updated an action plan or strategy to meet energy efficiency goals.

ESOS had some early impact on transport efficiency: A large proportion of those who own or lease vehicles have also implemented, or reported that they are considering, a range of fuel efficiency improvements within this time period. ESOS was reported to have directly influenced around 8% of compliant organisations to make one of these fuel efficiency improvements since early 2015. The most likely fuel-efficiency related improvements to have been implemented at least partly as a result of ESOS were adjustments to existing fleet vehicles or to journeys or loading practices. The evaluation evidence suggests that ESOS may have helped keep or push energy efficiency agendas primarily among organisations already interested in energy efficiency – this includes those reporting high levels of priority being placed on energy efficiency prior to ESOS (which tended to be larger, multi-site organisations) as well as those achieving compliance through ISO 50001 or via an internal assessor. Office-based organisations, particularly those close to the employee threshold for the scheme (or below where they had triggered eligibility due to high turnover), were among those least likely to be demonstrating any early impact from ESOS.

1.0 Introduction

Ipsos MORI and University College London (UCL) were commissioned by the Department for Energy and Climate Change (DECC)¹³ in April 2015 to undertake a process evaluation of the Energy Savings Opportunity Scheme (ESOS) and to design, and collect baseline evidence for, a future longer-term impact evaluation. This report presents findings from the process evaluation and a discussion of the early signals of impact. A separate report presents the findings of a feasibility study into the design of a full impact evaluation¹⁴.

1.1 Background to ESOS

Article 8 (4-6) of the EU Energy Efficiency Directive (2012/27/EU) requires all large non-SME¹⁵ enterprises (or smaller organisations that are part of a large group) to undertake audits or a specified equivalent or exemption (such as ISO 50001) of the energy used by their buildings, industrial processes and transport to identify cost-effective energy saving measures by 5 December 2015 and at least every four years thereafter. ESOS was developed by DECC to meet these requirements with a key aim of providing flexible and cost effective routes to compliance¹⁶ but with quality assured through an accredited assessor market (DECC consulted on the approach before introduction of the final scheme). Organisations notified compliance with the scheme administrator - the Environment Agency¹⁷ - with implementation of the energy saving measures identified left as voluntary.

¹³ The Department for Business, Energy and Industrial Strategy (BEIS) as of July 2016

¹⁴ Evaluation of ESOS: Impact evaluation scoping report

<https://www.gov.uk/government/publications/energy-savings-opportunity-scheme-esos-evaluation-of-the-scheme>

¹⁵ Small or medium-sized enterprises.

¹⁶ ESOS compliance can also be reached through ISO 50001 certification, a Display Energy Certificate, Green Deal Assessment or ESOS compliant energy audit.

¹⁷ The Environment Agency is the scheme administrator for the whole of the UK. Responsibility for compliance and enforcement rests with the Environment Agency in England and the equivalent devolved agencies i.e. Scottish Environment Protection Agency, Northern Ireland Environment Agency, Natural Resources Wales; and the Secretary of State for Business Energy and Industrial Strategy for organisations with wholly or mainly offshore activities).

1.2 Evaluation background, aims and approach

Six high-level questions were set by DECC for this evaluation:

KQ1: How have large organisations reacted to ESOS?

KQ2: How has the assessor market responded?

KQ3: How is ESOS influencing organisational energy efficiency policy and practice?

KQ4: Has ESOS been implemented in a way that has avoided unnecessary burden and cost?

KQ5: What impact has ESOS had on organisations?

KQ6: How have the benefits of energy efficiency been realised by large undertakings?

These evaluation questions have been assessed through the following activities:

- **Familiarisation interviews with stakeholders** involved in the design and delivery of ESOS to gain an understanding of the different elements of the scheme. The study team conducted 10 interviews with stakeholders at BEIS and the Environment Agency, the Department for Transport, and devolved administrations in spring 2015;
- **Management information review** of key policy and operational documents, applicant guidance documents (to refine understanding of the underlying logic of intervention, market failures motivating intervention, and the potential economic and social benefits anticipated). The team also reviewed related research and evaluation reports, including a separate non-domestic tracker survey by IFF Research ¹⁸;
- **Logic model development**, including a descriptive Theory of Change for ESOS. The process of developing the theory of change and logic model included a workshop with DECC and a range of external stakeholders in 2015. This provided a means of testing, refining and exploring the validity of assumptions made to the emerging logic model and theory of change on the basis of the document review, and identified additional aspects not then included;

¹⁸ DECC non-SME Tracker survey, results reported in Business Awareness and Uptake of Energy Audits <https://www.gov.uk/government/publications/business-awareness-and-uptake-of-energy-audits-research>.

- **Qualitative interviews** with 40 ESOS obligated organisations (25 pre-compliance, in November 2015 and 15 post-compliance in March 2016) and 10 assessor market firms (including energy audit service firms, trade bodies and register owners). The sample for obligated organisations were selected to represent characteristics including, size, turnover, industry sectors, country and number of sites. The lead assessors interviewed included a mix of in-house and external consultants, also sampled to represent different locations and types of registers.
- A **representative quantitative telephone survey** of 871 ESOS-obligated parent-level organisations. Interviews were conducted with a broad range of organisation representatives including board members, other senior staff and energy or facility managers, or their equivalent. The participants in the survey comprised: 801 organisations who had notified compliance, 20 organisations who had notified that they 'intended to comply' and 50 organisations who had not notified compliance by 25 August 2016¹⁹. The aim of this workstream was to gather evidence contributing to all six key evaluation questions, including to understand early indications of impact and to allow for longitudinal tracking of outcomes for any future impact evaluation.
- **In-depth case-studies with 10 organisations who had notified their compliance** to gain a detailed understanding of the processes involved in ESOS and to explore initial impacts. These case studies were designed to be reflective of the broad range of organisational factors and circumstances for ESOS participants, mainly selected from the representative survey. A range of characteristics were represented including size, industry sector, energy intensity, approach to investment in energy efficiency, approach to ESOS, choice of compliance route and whether party to other energy efficiency policies. Each case study involved a 1 to 2-day visit to the organisation; multiple interviews or discussion groups per organisation, (conducted across multiple contacts with varying roles/ responsibilities) and an analysis of organisation documentation supporting their ESOS compliance. Further detailed findings from the case studies are set out in the Technical Annexes to this report.

In addition, impact evaluation scoping work (including identification of, and feasibility testing and linking of secondary datasets) was conducted to inform recommendations for a longer-term evaluation of ESOS' outcomes and impacts (including an exploration of the longer-term benefits of compliance). This is reported on separately and focuses on planning an approach to answering key evaluation questions 5 and 6 in particular.

¹⁹ Non-notifying organisations were at this point "suspected non-notifiers" and it is possible that some of these organisations may have later been deemed out-of-scope of ESOS following checks into their eligibility criteria by the scheme administrator or alternatively may have been brought into compliance. Note that obligated organisations may have also notified that they did not qualify for ESOS but this group were not sampled for the survey.

Further information on each of the evaluation workstrands summarised above is available in the technical annexes to this report²⁰. This includes more detailed coverage of the specific aims of each workstrand and the approaches taken to both quantitative and qualitative sampling, data processing and analysis.

1.3 Limitations to the evaluation

The following limitations should be borne in mind when reviewing the evaluation findings:

- **No central collection of ESOS energy audit reports in the policy design** restricted an assessment of the quality and relevance of energy efficiency recommendations made; an important process and impact issue as uptake of recommendations will be influenced by the quality, appropriateness and credence given to these reports. This is also important given the scheme's flexibility around the format, length, range of content and quality of how these reports were delivered. A small sample of energy audit reports undertaken by complier organisations were accessed through the case-study visits providing some insight into these issues.
- **Challenges identifying subsidiaries that were in scope of ESOS at an early enough stage in this evaluation** led to the surveying of parent-level organisations²¹ only, limiting the evaluation's understanding of both process and impact issues across subsidiary-level organisations. This also limits the generalisability of the evaluation findings to the wider non-domestic sector.
- **Early stage in policy cycle for identifying outcomes and impacts** – previous research by the Carbon Trust²² reports that, on average, organisations can take between two and four years to implement energy efficiency recommendations. As evidence collection for this interim evaluation took place mostly over the first year following the compliance deadline of December 2015 (and over a shorter period for those complying within the extended grace periods up to July 2016), it is too early to draw firm conclusions on the policy's longer-term sustained impact.

²⁰ Evaluation of ESOS: Interim process and early impact evaluation report: Technical Annexes.
<https://www.gov.uk/government/publications/energy-savings-opportunity-scheme-esos-evaluation-of-the-scheme>.

²¹ Parent level organisations refer to the highest UK parent, which acted as the 'responsible undertaking' for ESOS compliance of the overall group as a whole

²² Energy Savings from Audits, 2015. Available at:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/323113/ESOS__Analysis_of_the_Potential_for_Energy_Savings_from_Audits_FINAL.pdf (Accessed July, 2015)

1.4 Terminology used in this report

The following terminology is used within this report and is based on notification data published by the Environment Agency in August 2016²³. This notification data is as submitted by organisations and has not yet been verified by the scheme manager:

Complier – organisations that submitted an ESOS compliance notification by 30 June 2016.

Intend to comply – organisations that submitted a notification by 25 August 2016 to state that they intend to comply with ESOS at a later date.

Do not qualify – organisations that submitted a notification by 25 August 2016 to state that they do not consider their organisation to qualify under the ESOS regulations. Checks into the eligibility status of these organisations are ongoing by the scheme manager.

Suspected non-notifiers – organisations that had not submitted any ESOS notification by 25 August 2016 (i.e. they had not submitted a compliance, intend to comply or do not qualify notice). These organisations are not referred to as 'non-compliant' within this report as it is possible that some of these organisations may be deemed out-of-scope of ESOS once further checks into their eligibility criteria are conducted on a case-by-case basis.

Obligated organisations – organisations that are deemed in-scope of the ESOS regulations on the basis of publicly available information about their employee size, annual turnover and (in the case of the educational sector) sources of funding. However, the number of organisations within this group is subject to change past the close of this evaluation as checks into the eligibility status of organisations is ongoing by the scheme manager.

1.5 Structure of this report

The contents of this report are structured as follows:

Chapter 2: Overview of ESOS – provides an overview of the Energy Savings Opportunity Scheme (ESOS), including a summary of its aims and objectives, how the regulation was designed and delivered, and its expected effects on the energy efficiency behaviour of obligated organisations within the wider policy and external landscape.

²³ ESOS Published Data available here: <https://www.gov.uk/guidance/energy-savings-opportunity-scheme-esos>

Chapter 3: Initial Organisational Response to ESOS – considers how obligated organisations have responded to ESOS, exploring the effectiveness of awareness raising activities and scheme communication processes as well as the drivers of compliance activity.

Chapter 4: Assessor Market Response to ESOS – considers how the energy assessment market has responded to ESOS, including the effectiveness of processes to create a sufficiently large and high quality supply of assessors to support organisations in compliance activity.

Chapter 5: Influence and Impact of ESOS on organisational energy efficiency – considers what early signs of influence and impact are observable from ESOS on levels of organisational interest and priority for energy efficiency and implementation of energy efficiency measures, including transport related measures.

Chapter 6: Costs of compliance - assesses the extent to which the scheme's objective of minimising the resource and financial burden on obligated organisations has been achieved against cost assumptions made in the original Impact Assessment in 2014.

2.0 Overview of ESOS and theoretical framework

This section provides an overview of the Energy Savings Opportunity Scheme (ESOS), including a summary of its aims and objectives, how the regulation was designed and delivered, and its expected effects on the energy efficiency behaviour of obligated organisations. Consideration is also given to the wider policy context into which the regulation was introduced.

2.1 Aims and Objectives

The European Union (EU) has a target to reduce primary energy consumption by 20 percent by 2020 (against a business-as-usual projection made in 2007) through improvements in energy efficiency. In 2011, the European Commission estimated that the EU was half-way towards this target based on existing policies. The EU Energy Efficiency Directive (2012/27/EU)²⁴ was introduced as part of a drive to establish a common framework of measures to promote energy efficiency across different sectors of the economy throughout the EU. The ESOS Regulations 2014 were implemented in the UK in response to Article 8 (4-6) of this Directive. The objectives of ESOS are to:

- Provide large enterprises with enterprise-specific information about how they can make energy savings;
- Stimulate the take-up of cost-effective energy efficiency measures;
- Minimise the cost to businesses of complying with the regulations; and,
- Maximise the synergies with existing policies.

2.2 Rationale for intervention

The UK Energy Efficiency Strategy (2012)²⁵ highlighted the energy efficiency potential remaining in the commercial and industrial sectors. While in principle, organisations have an incentive to realise these efficiencies where it is profitable to do so, market failures are

²⁴ Eur-lex.europa.eu, 2015. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1399375464230&uri=CELEX:32012L0027>

²⁵ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/65602/6927-energy-efficiency-strategy--the-energy-efficiency.pdf

likely to inhibit the extent to which they do so without public sector intervention. Organisations will often require external advice to identify suitable energy efficiency investments. Cultural barriers, such as the level of priority given to energy efficiency in corporate decision making structures, may also lead to unrealised energy efficiency gains²⁶. ESOS was designed to respond to these market failures by requiring large organisations to gather information on the cost and benefits of the energy efficiency measures (opportunities) available to them, while securing board level visibility of these opportunities.

2.3 Theoretical Framework

This section provides a framework for a process evaluation of ESOS (and an exploration of its initial impacts) by setting out the inputs and activities being delivered by the scheme and explaining the way in which these are anticipated to lead to its desired outputs, outcomes and impacts. The rest of this report provides an assessment of the effectiveness of the processes detailed here.

Inputs

ESOS' inputs, in the form of organisational resources (staff time and funding), have been provided through: BEIS in collaboration with other central Government departments and the devolved administrations; the Environment Agency and regulators of the devolved administrations.

Over a 16-year time period (four cycles of ESOS), the Impact Assessment²⁷ estimated the Government's scheme administrative costs at £10 million. Energy assessors also incur the cost of obtaining accredited status (estimated at £20m). Time and capital funds from obligated organisations are also a key input, estimated as including an administrative burden of £235m, assessment costs of £165m, and the capital cost and hassle cost of implementing measures of £750m²⁸.

Activities

ESOS' activities are mostly associated with securing and monitoring compliance through:

²⁶ Reported in the Electricity Demand Reduction (EDR) Pilot Interim evaluation findings. Available at: <https://www.gov.uk/guidance/electricity-demand-reduction-pilot>

²⁷ Impact Assessment: Energy Savings Opportunity Scheme, 2014. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/323116/ESOS_Impact_Assessment_FINAL.pdf

²⁸ The Impact Assessment estimates are based on 9,400 large enterprises but the final number is likely to be lower following compliance checks by the Environment Agency.

- **Awareness raising and communications** around scheme requirements and participant eligibility: including direct mails, roadshows, scheme guidance publication and helpdesk service, as well as channels external to the scheme such as industry press and assessor marketing.
- **Accreditation** of ESOS assessors via organisations independently verified as meeting the requirements to host accredited registers.
- **Audit and compliance activity** including certification activity for those complying through ISO 50001²⁹, or other compliance routes or detailed analysis of an enterprise's energy consumption and potential for making energy efficiency improvements through audit activity. ESOS assessments aim to provide: cost effective opportunities to improve energy efficiency and quantified estimates of energy savings available from implementing recommendations, and be conducted, overseen or reviewed by a sufficiently qualified assessor. The key activities undertaken by obligated organisations are presented in Figure 2.1 (overleaf).
- **Quality assurance checks and enforcement regime** by the scheme administrator (and regulators in the devolved administrations) through Lead Assessor and compliance notification and report audits, compliance, enforcement or penalty notices³⁰, and publication of compliance notification data.

Outputs

The expected outputs from the activities described above include; awareness and understanding of the scheme among obligated organisations, a supply of accredited assessors to support compliance activity, the completion of energy audit, other compliance activity or ISO 50001 certification by obligated parties, and submission of compliance notifications which include board-level sign-off.

Outcomes

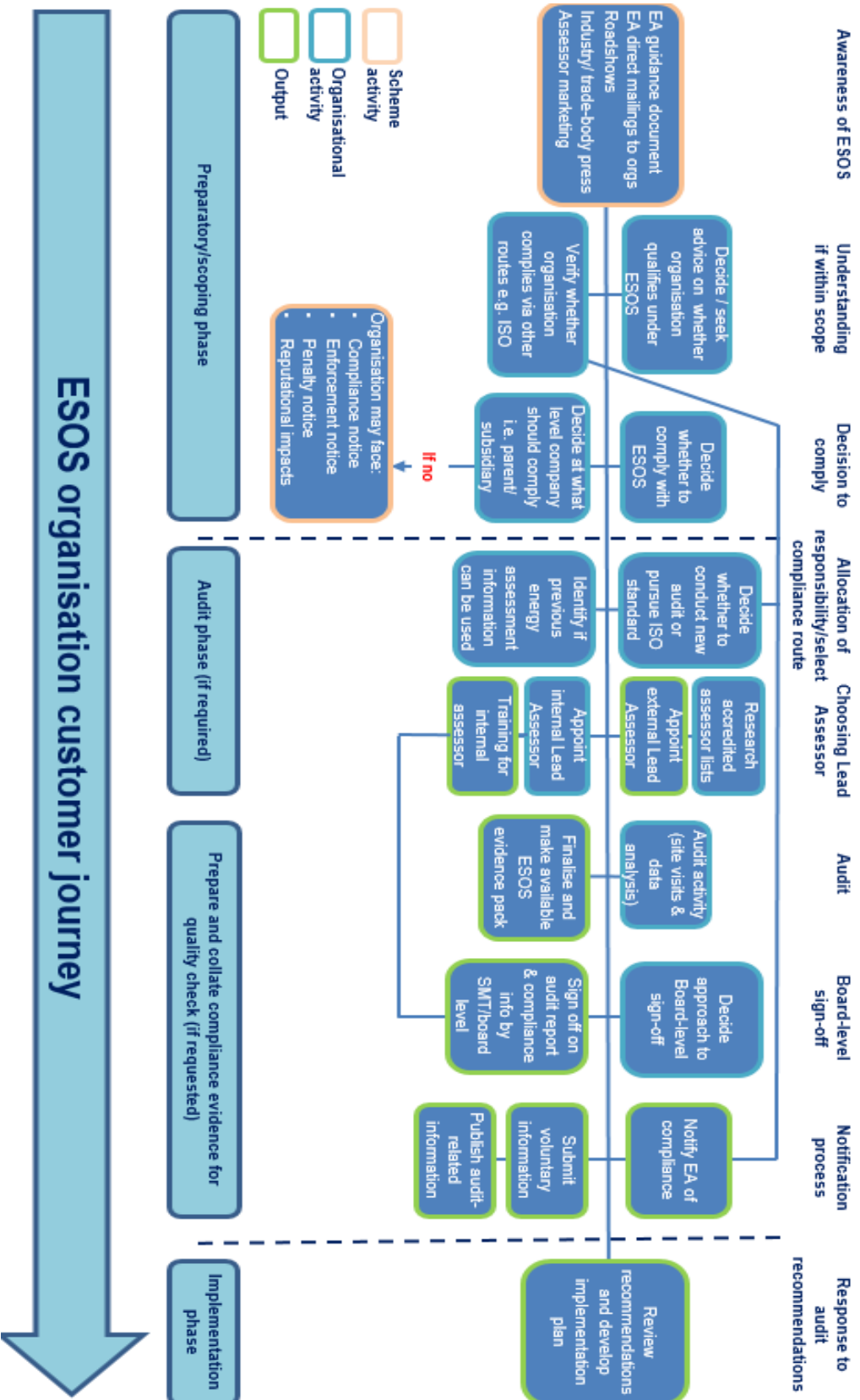
Anticipated outcomes from ESOS can be summarised into three categories:

- **Organisational outcomes:** By addressing information market failures, the policy will lead some organisations to have an increased awareness of the opportunities to invest resources in improving their energy efficiency to reduce their energy costs (and increase profits). The extent to which this leads to outcomes of energy efficiency measures installed, or energy efficiency targets and action plans pursued will depend (as reported by the EDR interim evaluation) to a large extent on organisational factors such as the scale and autonomy of budgets, the capacity and skills of staff, business continuity issues, competing investments as well as the

²⁹ ISO 50001 is a quality management system for energy use management based on a model of continual improvement also used for other standards such as ISO 9001 or ISO 14001.

³⁰ Fixed penalties ranging up to £50,000 depending on level of regulation breach

Figure 2.1 : Key organisational processes under ESOS (activities and outputs)



Source: Ipsos MORI, 2015

quality of, and credibility given to energy audit information, and perceptions of reputational benefits.

- **Assessor market outcomes:** through supply side response to the additional demand for energy efficiency audits, the assessor market is expected to expand in size.

Other secondary market outcomes are also possible, for example, technology producers³¹ or analytics organisations seeking to utilise data generated through the scheme for technology and service innovation.

Impacts

The ESOS Impact Assessment estimated a benefit from energy savings of around £2.2bn. In addition, projected improvements in air quality were valued at £320m, with the value of future abatement costs associated with reduced GHG emissions valued at £280m. These broader benefits of ESOS are also anticipated in the longer-term:

- **Improvements in energy efficiency** through installation of measures or other actions to reduce energy consumption; reducing energy costs for a given level of output or volume of sales;
- **Reduced maintenance spend** through installation of better performing energy management systems, or specific energy efficiency measures (such as longer lasting LED bulbs);
- **Improvements in productivity** (i.e. a reduction in unit costs), with the size of this effect dependent on how far energy efficiency investments have ‘crowded out’ other investments with the potential to raise productivity. DECC analysis estimates that ESOS will reduce energy consumption by 3TWh each year, with businesses saving over £250m on their energy bills and that the scheme will deliver a net benefit to the UK of £1.6 billion NPV (calculated over 15 years); and,
- **Increased output** (GVA) – if firms choose to reduce prices in response to efficiencies realised, they may increase their market share, leading to an increase in overall production. The net effect at the level of the UK economy will depend on how far this market share is taken from domestic competitors. Meeting higher levels of demand may also increase energy consumption, however, offsetting initial reductions (a re-bounce effect).

³¹ Although in line with HMT Green Book, any increase in demand will place pressure on the price of key inputs (e.g. labour, raw materials, property) leading to an offsetting reduction in demand elsewhere.

There will also be a range of wider social benefits. Reductions in energy consumption will also lead to lower non-traded CO₂ emissions and better air quality, and reduce the number of EU ETS allowances UK businesses need to buy. Reducing energy demand through energy efficiency also improves security of supply. It reduces the UK's exposure to volatile international energy markets and means less energy infrastructure is required, lowering the overall costs of the energy system. The Impact Assessment states these as all indirect benefits as they result from the implementation of assessment recommendations, rather than the assessments themselves.

2.4 Wider policy landscape and uncertainties

Industrial energy efficiency is central to the Government's energy policy³² and ESOS operates within a complex policy landscape. Within this context, ESOS has sought to be deployed in a way which minimises the cost to business and maximise synergies with other energy efficiency schemes, such as the CRC Energy Efficiency Scheme. Over the evaluation period there have been changes to this landscape with the announcement of reforms to improve the energy tax and reporting regime, including working with the devolved administrations to close the CRC after the 18/19 compliance year and absorbing the price signal into the Climate Change Levy³³. It was also announced that Government would consult on a new simplified energy and carbon reporting framework proposed to be introduced by April 2019.

Experiences, viewpoints and expectations on these different policies may affect how organisations view ESOS. These may also affect approaches taken to, and the ease with which organisations can reach compliance. Exposure to other reporting obligations and energy management systems may also influence how likely or not organisations are to exploit the findings of the ESOS audit. The Impact Assessment flags the influence of other related policies on the impacts of ESOS as a key uncertainty; it assumes that while the impact of ESOS will likely be smaller where an existing policy is already acting to improve energy efficiency, the requirements of Article 8 go beyond the scope of existing policies (such as covering a larger proportion of energy demand and requiring detailed recommendations for improving energy efficiency) and so the introduction of ESOS is overall expected to have an additional impact on energy efficiency, even for enterprises already covered by existing policies.

³² See Green Paper 'Building our Industrial Strategy' (2017) available at: <https://www.gov.uk/government/consultations/building-our-industrial-strategy>

³³ HMRC, Climate Change Levy: main and reduced rates, 2016, <https://www.gov.uk/government/publications/climate-change-levy-main-and-reduced-rates/climate-change-levy-main-and-reduced-rates>.

Further external factors will also affect the realisation of ESOS' outcomes. This includes, for example, energy prices which will be important in shaping the board-level priority given to energy efficiency. A future longer-term impact evaluation of ESOS will involve a detailed consideration of external factors. Potential approaches to the measurement of outcomes, and the disentanglement from other contextual and temporal factors, are discussed in a separately published ESOS Impact Evaluation Scoping Report.

3.0 Initial organisational response

This section considers the effectiveness of awareness raising activities and scheme communication processes as well as the drivers of compliance activity and choice of compliance route to understand how organisations have responded to ESOS.

Summary of organisational response to ESOS

Awareness of ESOS was high among obligated-organisations; 90 percent of those interviewed were aware of the requirements six months ahead of the compliance deadline. Evaluation evidence suggested informal word-of-mouth, often through Lead Assessors or industry bodies, was an important contributor to awareness-raising around the scheme.

Official scheme guidance and helpdesk services were found helpful and easy to use. While the notification process was reported to be straightforward, some notifying organisations made errors in the recording of their company structure information, e.g. recording of subsidiaries.

By 5 December 2015, the Scheme Administrator, the Environment Agency, had received approximately: 4,000 compliance notifications, 2,500 intent to comply late notifications, and 400 'do not qualify' notifications³⁴. However, some organisations left their compliance activity until close to the deadline leading to a compression of demand for energy audit activity in the months leading up to the compliance deadline.

Compliance was mostly reached through energy audit activity undertaken or commissioned by obligated organisations (ca. 83%) with ESOS perceived by many obligated parties as a regulatory requirement, rather than energy saving opportunity. There were exceptions, with some larger high energy-use organisations, or those providing public sector services, keen to derive value for their business through their compliance activity – in some instances motivating ISO 50001 certification.

Factors contributing to delayed compliance were mostly internal to organisations (stemming from ESOS being a low business priority or as structural complexities led to longer decision-making around how to comply), but in a few cases external factors such as the availability of assessors to conduct site visits contributed. Among those who had not notified compliance,

³⁴ Published here: <https://www.gov.uk/guidance/energy-savings-opportunity-scheme-esos>

not meeting the scheme eligibility thresholds for company size or type of organisation were most commonly given as reasons in the survey.

3.1 Awareness raising activity

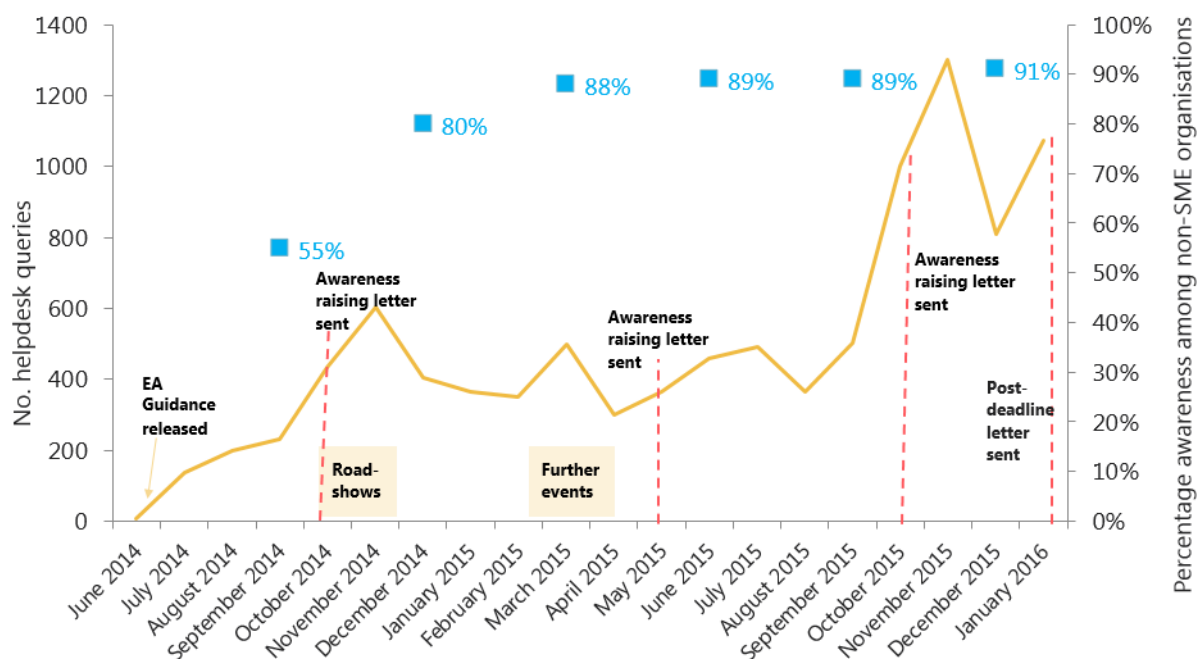
Awareness of ESOS was high among organisations in scope of the scheme (often as a result of non-official information sources in the first instance), and official scheme information sources and guidance were well received.

Official awareness raising activities led by the Environment Agency and DECC involved a consultation (July to October 2013), followed by a comprehensive guidance document published in June 2014³⁵, regional roadshows, direct post and emails, newsletters and further stakeholder events. Most organisations interviewed as part of this research reported they had become aware of ESOS through non-official sources, such as industry press, word-of-mouth at industry events or marketing communications from assessor firms. Eighty-eight percent of non-SMEs were recorded in DECC's tracker survey as being aware of ESOS obligations by March 2015 (as illustrated in Figure 3.1). However, there were challenges encountered in reaching remaining non-SMEs, with around one in ten unaware of ESOS at the point of the compliance deadline.

Feedback on scheme guidance and the helpdesk was positive from both organisations and assessors, with these sources found to be helpful and generally easy to understand. The helpdesk was particularly intensively utilised in the months close to the compliance deadline, with Environment Agency records suggesting most users were seeking clarity on their eligibility. The qualitative research showed that there were some instances where organisations remained uncertain following their call to the helpdesk of their eligibility status particularly where they were in the educational or charity sector and eligibility depended on sources of funding, or in the case of complex company hierarchies.

³⁵ ESOS guidance accessible at: <https://www.gov.uk/guidance/energy-savings-opportunity-scheme-esos>

Figure 3.1 Awareness levels of ESOS among non-SME organisations mapped against ESOS scheme awareness and communication activities



Source: DECC non-SME Tracker 2015; Environment Agency Scheme Management Information Jan 2016

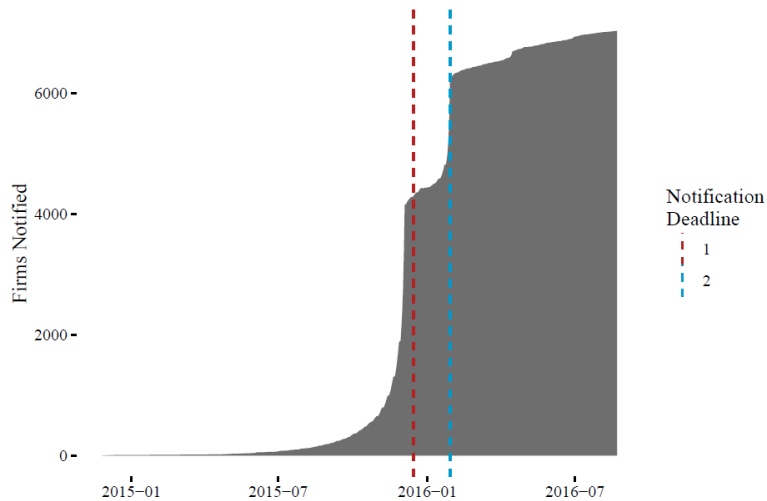
3.2 Notification of scheme compliance

By 5 December 2015, the Scheme Administrator, the Environment Agency, had received approximately: 4,000 compliance notifications, 2,500 intent to comply late notifications, and 400 do not qualify notifications.

Since the December 2015 deadline, the Environment Agency has continued to work to bring organisations into compliance and the number of compliance notifications has increased. Figure 3.2 shows the increase in notifications from January 2015 until July 2016. As at July 2017, the latest data available, 6,870 compliance notifications had been received³⁶.

³⁶ It is estimated that around 6,300 Ultimate Parent Groups (including all their subsidiaries) are obliged to participate in ESOS

Figure 3.2 – Date of ESOS compliance notifications



Source: Environment Agency compliance database, July 2016

3.2.1 Factors driving timing of notification compliance

Compliance activity was compressed in the immediate period ahead of the compliance deadline; Environment Agency compliance notification data shows a significant spike in compliance around one month prior to the 5 December 2015 deadline. There were no specific process issues leading to delayed or late compliance; it is mainly reflective of the low priority placed on ESOS by certain organisations.

Environment Agency compliance data shows a significant spike in compliance around one month prior to the initial December 2015 deadline (Figure 3.2, above). In addition, 33% of all who complied by July 2016, complied in the final week before 5 December 2015, with a further 30% of notifications logged by the end of January 2016

The most common reasons uncovered during the qualitative research for delayed or late compliance included:

- **Low priority placed on energy efficiency and ESOS:** for many ESOS was not a business priority, leading some organisations to start compliance activity with insufficient time before the first deadline; often linked to an underestimation of the time required. There were a range of reasons, across the full spectrum of organisational types, for this low prioritisation of ESOS. For some it was driven by the relatively low proportion of overall operating costs represented by energy use, while for others there was a lack of belief in the value of energy efficiency action for their organisation (for example, where their energy use was seen as ‘fixed’).

- **Internal complexity factors:** some organisations were slow to start their compliance activity whilst they decided internally how to apply flexibility in the scheme to their organisational structure – such as the level of aggregation at which to submit notification. This was particularly the case for large-scale, multi-national organisations with complex parent and legal entity structures and also those near qualifications thresholds or in the education or charity sectors;
- **External factors,** to a lesser extent, affected the timing of compliance activity. Assessors were often described as driving the compliance timetable on behalf of organisations (setting site visit schedules and reporting deadlines). Where assessors were commissioned in the last quarter of 2015, supply side issues to manage this peak in demand led to some delays in reports being provided.

Case-study evidence: three examples of drivers of compliance timing

Low board-level priority: one firm gathered three external auditor quotes in March 2015, but the board requested further progress towards compliance to be put on hold (based on uncertainty around future of scheme and whether non-compliance would be penalised). Internal go-ahead was given in June 2015 (following receipt of further information about non-compliance penalties).

Leaving notification until close to deadline: a transport operator became aware of ESOS in early 2014 and was already compliant through ISO 50001 certification. Notification of compliance was submitted close to the deadline (as the firm saw no motivation to notify sooner).

Lead assessor driving compliance timeline: a chemical engineering company commissioned their lead assessor in January 2015, but did not undergo their first site visit until September 2015. For this company, this timetable was driven by the lead assessor to fit around other demands. The delay in the site visits led to pressure on delivering the final report in advance of the deadline.

In the pre-compliance qualitative research, there was also some uncertainty shown by organisations over the strictness of the compliance deadline and the likelihood of penalties and this type of attitude may have also influenced the timing of compliance.

Among organisations responding to the quantitative survey, 20 stated that they were yet to, but intended to, comply (with around half expecting this to be within 2016). Among these 20 organisations, six reported that they had only recently learned of their eligibility for the scheme (all had fewer than 250 employees), while three cited a lack of capacity among external assessors. Other reasons given included prohibitive costs of compliance.

3.2.2 Choice of compliance route

ESOS was largely perceived as compliance activity first and foremost rather than as an energy saving opportunity. This had important consequences for approaches to compliance, including a preference to commission external assessor services (rather than accrediting an internal assessor or seeking an ISO 50001 standard, for example), and seeking the lowest price compliance option.

Analysis of the Environment Agency's published notification data (from January 2017) shows that most compliant organisations commissioned external energy auditing services (83%) to determine the majority of their energy consumption, with much lower proportions using ISO 50001 (c. 5.7%) or Display Energy Certificates (c. 3.5%) or Green Deal (0.1%)³⁷. While the notification form data shows that larger organisations were the most likely to accredit an internal assessor, compliance through ISO 50001 certification was consistent across organisations of different sizes. Organisations in the construction sector were more likely to comply via the ISO 50001 route than others; survey evidence suggested that those organisations giving higher priority to energy efficiency were more likely to choose this route.

Qualitative evidence indicated the perception of ESOS as principally a regulatory requirement had important consequences for how organisations approached compliance:

- Audits were perceived to be the least burdensome way of reaching compliance. Organisations often sought to sub-contract all responsibility for compliance to a third party consultant, including providing them with the authority to approach and collect energy usage data on their behalf and complete and submit the compliance notification (only 3% of those complying through energy audits did so through accrediting an internal lead assessor³⁸);
- Cost was a driving factor in the choice of compliance route, and in the selection of assessor services, with many selecting the lowest price quote;
- Organisations tended to prioritise convenience after cost; many selected their most local assessor whilst others commissioned an assessor who they had dealt with in the past (as opposed to, for example, seeking an assessor with specialist skills).

³⁷ In addition, approximately 8% of notifications were from organisations that used multiple compliance routes across their total energy consumption or had energy consumption that was not audited under de minimus rules ($\leq 10\%$).

³⁸ According to analysis of Environment Agency compliance database, January 2017. Note that organisations may have used more than one compliance route for some or all of their total energy consumption.

“It didn’t have any business value for us. We wanted the cheapest option, it’s just a regulatory report we were required to do”

Complier, audit, oil and gas, Health and Safety co-ordinator

For three of the evaluation’s case-study organisations that complied through ISO 50001 certification (a large-scale transport operator, a multi-national professional services firm and a large, UK-based manufacturing company), their motivations were less related to cost and instead were driven by a belief that their organisation would benefit in the longer-term from this approach to ESOS, either in energy savings or reputational benefits.

In the qualitative research, some assessors and organisations identified the timeframe of the compliance deadline as a barrier to compliance via the ISO 50001 route. Assessors reported that they advised organisations against the ISO route from summer 2015 believing it would not be possible to complete the process by December 2015, or subsequently the extended deadline of June 2016. As illustrated above, the non-SME tracker³⁹ showed 80% of organisations were aware of ESOS in December 2014, suggesting that organisations timed themselves out of the ISO route because they left it too late to initiate this activity.

The following two contrasting case-study examples illustrate the role of pre-existing attitudes towards energy efficiency on the approach to ESOS compliance:

Case study evidence: Motivations & drivers of compliance

Advertising & marketing parent firm complying via external audits:

This large firm employed over 10,000 staff in the UK and spent £3m annually on office-based space heating, cooling and IT equipment.

Energy costs were considered negligible by this firm’s CFO in the context of business outgoings, and there was a lack of belief in the effectiveness of energy efficiency measures (representing a general point of view rather than reflecting information received or evidence of payback in practice). ESOS compliance was considered a regulatory exercise and reputationally important. Internal staff time was kept to a minimum through subcontracting energy audit-led compliance activity to an external consultancy firm.

³⁹ In September 2014 DECC commissioned research among non-SME organisations to survey awareness and attitudes towards ESOS and energy audits. This was carried out over six waves between September 2014 and December 2015. Reported in in Business Awareness and Uptake of Energy Audits <https://www.gov.uk/government/publications/business-awareness-and-uptake-of-energy-audits-research>

Manufacturing firm complying via ISO 50001 certification:

This firm placed a strong focus on environmental and energy credentials, including Group-level reporting of energy and carbon usage, tracking of performance on the Dow Jones Sustainability World Index and certification to ISO 14001. The firm complied via ISO 50001 as it wanted to demonstrate continuous improvement and to provide a framework for energy management longer term.

ESOS expedited the ISO 50001 certification process for this organisation – while certification had been previously considered (and they already had ISO 14001) ESOS was described as the trigger to achieve this at this point in time.

3.2.3 Experience of, and approach to, compliance notification process

Organisations reported the compliance notification process was intuitive and straightforward. However, compliance audits by the scheme administrator have shown some inaccuracies in the recording of company structure information by some organisations and this might reflect a misinterpretation of the information required or other issues over defining organisational structures.

While organisational and assessor respondents in the qualitative research mostly reported the notification process to have been straightforward, a few felt it was not tailored sufficiently for those notifying compliance via ISO 50001 (with questions focused on energy audit data or audit reports for example).

Subsequent compliance audits by the Environment Agency have found some instances of discrepancies, between the number of listed organisations covered by a compliance notice and the expected number of companies reporting within that organisational group. This may reflect a misinterpretation of the information requested at this point in the notification (for example, only listing group members that consume energy, or recording an organisation as a single entity rather than the sum of its individual subsidiaries), or wider challenges in defining organisational structures in the context of the scheme requirements. An example of this occurring in practice is provided below from one of the case-study organisations.

Case study evidence of compliance notification issues & inaccuracies

A high energy-using chemical engineering company had a number of legal entities within its parent group and had recently undergone re-organisation.

The compliance notification was submitted in advance of the December 2015 deadline but was subject to a compliance check by the Environment Agency – targeted due to a discrepancy between the number of legal entities according to

Companies House data (i.e. the number of legal entities officially registered to that organisational parent) and recording of this information in the ESOS notification form.

On further investigation, the organisation was informed that group subsidiaries which were dormant (i.e. no assets or premises), and therefore had no energy usage, had been wrongly excluded in their notification. The organisation has been given the opportunity to re-submit its notification to correct this error.

3.2.4 Reasons for not notifying compliance

Not meeting the scheme eligibility thresholds for company size or type of organisation were most commonly given as reasons for not notifying compliance among surveyed organisations. A review of the characteristics of these organisations showed they were less likely overall to meet these requirements as well as less likely to be part of a wider corporate group or to have previously complied with the CRC scheme.

Among organisations surveyed, those reporting themselves to have not notified compliance appeared to be organisations that may not qualify for the scheme. They tended to be characterised by their relatively small size or turnover (also given as the most common reasons for not considering ESOS to be applicable to them) – over two-fifths (43%) employed fewer than 250 employees (compared to 20% of compliers) whilst 22% had a turnover of £50m+ (compared to 50% of compliers). Non-notifying organisations surveyed were also less likely to be part of a wider corporate group (71% were not, compared to 46% of compliers). Further reasons given for ESOS not being applicable included, having charity status or receiving no private funding (the most common sector among non-notifiers in the survey was education (11%)), having no or low energy use, believing a landlord would be undertaking compliance activity on their behalf or the prior possession of ISO 50001 accreditation.

4.0 Assessor Market Response

This section considers how the energy assessment market has responded to ESOS, including the effectiveness of processes to create a sufficiently large and high quality supply of assessors to support organisations in compliance activity.

Summary of assessor market response to ESOS

Overall, a sufficient supply of high quality accredited assessors was in place to meet the requirements for ESOS, with over 900 assessors registered.

Demand for assessor services peaked close to the deadline, leading to pressure on the prices of energy audit services. However, there is no evidence that this in itself prevented compliance notification, although some organisations delayed their compliance.

Preliminary quality assurance checks conducted by the Environment Agency found ESOS energy audits undertaken by obligated organisations met the scheme's requirements (although some required remedial action).

While surveyed complier organisations reported high overall levels of satisfaction with the content of the energy audit reports, perceptions of value for money were lower and qualitative evidence suggested some variability in the level of depth and detail provided.

4.1 Creation of a sufficient supply and quality of assessor market

4.1.1 The ESOS assessor register approval process

The process of approving industry bodies and other organisations to host registers of accredited assessors can largely be considered to have met its aims, although some efficiencies have been recommended by those involved.

An independent contractor appointed by the Environment Agency led the process of approving ESOS registers. Their role was to assess applications from prospective register holders against stated requirements⁴⁰ and in accordance with guidance circulated to applicants. Approved registers provided a means for obligated organisations to procure an accredited Lead Assessor with the relevant qualifications and experience. Of the 23

⁴⁰ Publicly Available Specification (PAS) 51215

applications submitted from across a mix of industry bodies and training and certification providers, 14 were successful in becoming approved ESOS assessor registers and were officially launched in October 2014.

While overall views of the register approval process were positive, in qualitative interviews with firms in the assessor market suggestions were made to improve its efficiency. The application process was designed to be highly flexible so as to reduce the burden on applicants. However, this was reported to have resulted in a lengthy period of returning bespoke clarification questions to applicants and assisting them in interpreting the guidance and regulations. Two register holders each reported the application process to have taken three months for their organisation in total. On the basis of this evidence, the flexible approach may have inadvertently, therefore, led to more significant resource than intended being required from both the approval body and the applicant organisations. A more prescriptive approach (with defined minimum standards and with conditional approval letters that stated key requirements for application approval), was recommended by stakeholders to overcome this.

4.1.2 Effectiveness of processes to generate high quality ESOS assessor services
Preliminary quality assurance checks conducted by the Environment Agency found register holders and assessors to generally meet the required standards, including a small sample of checked energy audit reports. Whilst organisations mainly reported high levels of satisfaction with their energy audit reports, there is some variation in the perceived quality of these and the wider assessor market.

Assessing quality in the creation and maintaining of approved registers

Over 900 ESOS Lead Assessors were accredited to 14 approved ESOS assessor registers, hosted by a mix of industry bodies and training and certification providers. To ensure only assessors meeting the required standards became accredited, applicants had to submit their qualifications and experience and indicate their skillset in specific sectors. Accreditation to most registers also required prospective ESOS Lead Assessors to undertake training, generally lasting one day. Assessors described the training courses as 'light touch' and to focus primarily on familiarisation with the ESOS policy rather than energy auditing techniques. This was considered appropriate given the long-term experience of many assessors in energy auditing and consultancy. However, a few assessors believed the training could have offered more specific advice on the application of ESOS guidelines in particular circumstances, such as for organisations in the transport or aviation sector or for organisations with large fleets or where complex site sampling may be required. Following training, assessors registered to at least some of the registers, were required to sit an exam in order to complete their accreditation.

The accreditation process was not considered by all across the assessor market to have always resulted in assessors with the appropriate skills and qualifications becoming ESOS-approved. A representative of one register reported their accreditation failure rate to have increased from 5% to 25% during the ESOS period which they attributed to unsuitable candidates being attracted to ESOS, and that they had reached “the bottom of the barrel”. This respondent expressed concern that these assessors may get approved through other registers or attempt to operate anyway under the scheme. An assessor also believed there was a drop in quality as the compliance deadline approached.

“Unscrupulous people are jumping on the bandwagon without the right qualifications to do this.”

ESOS Lead Assessor

Some assessors reported seeing very low cost energy audit services offered; examples were given of prices being marketed to organisations which were considered unrealistically low and a potential indicator of low quality services.

Assessing quality in services provided by ESOS Lead Assessors

To assess the quality of Lead Assessor services the Environment Agency reviewed an initial 50 ESOS energy audit reports completed for obligated organisations⁴¹. This review found the energy audit reports to generally meet the procedural requirements; all passed the audit, although some required remedial actions. Corrective action was most commonly advised for the accurate recording of organisational structure information (from misinterpretation of what constitutes an ‘active’ undertaking), ensuring sign-off from a board level director and supply responsibility where premises are rented.

For the most part, satisfaction among complier organisations with the content of their energy audit reports was high. As shown in Figure 4.1 below, the majority in the survey were satisfied with the level of detail included (81%), the range of recommendations provided (74%), the suitability of recommendations for their organisation (71%) and the clarity of information provided about the costs and savings of recommendations (71%). Confidence in the energy audit report was also high; 74% were confident in the estimated costs of implementing the recommendations and 70% were confident in the predicted benefits.

As shown in Figure 4.1, almost half of the compliers who had received their final reports reported that they were satisfied with the value for money the report represented to them

⁴¹ This was conducted as a small-scale pilot by the Environment Agency to assess the success of conducting quality checks through this process and to collate relevant intelligence so participating assessors and organisations in the pilot could be informed of common errors and good practices.

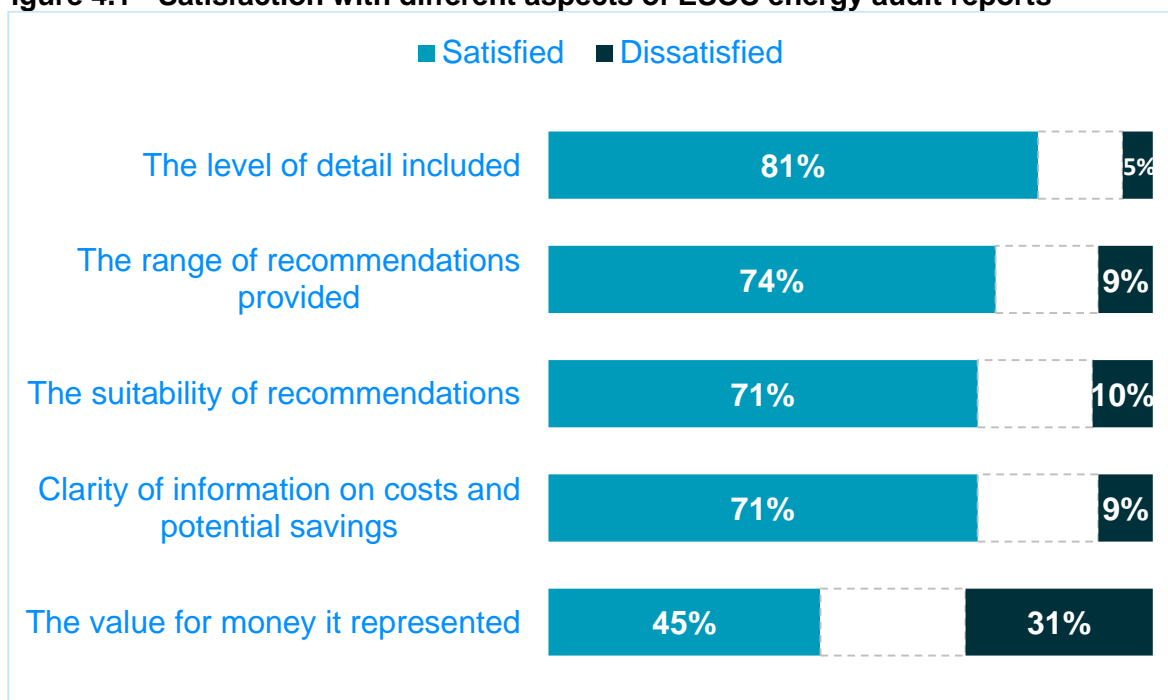
(45%). Qualitative evidence from both assessors and organisations also suggested some variation in the quality of ESOS energy audit reports produced. A few organisations who were not satisfied with the quality of their ESOS energy audit report, cited basic errors in the information included about their organisation (such as site names or company financials provided to the auditors for example) as well as limited additional value in the recommendations provided above and beyond what they felt they were already aware of.

Some external assessors interviewed as part of the case studies also expressed concerns about report quality. One said that more guidance, or provision of examples of high and low quality energy audit reports would have helped external auditors self-regulate, and helped set expectations for client organisations as to what quality of reporting they could expect.

“As ESOS lead assessor it has been very difficult to gauge the quality standard that is appropriate. You need examples of good and bad ESOS assessments. There are no quality standards.”

ESOS Lead Assessor

Figure 4.1 - Satisfaction with different aspects of ESOS energy audit reports



Source: ESOS Evaluation survey, 2016, Base: 724 compliant organisations who had received their final ESOS energy audit report ⁴²

⁴² The figures for “Neither satisfied nor dissatisfied” or “Don’t know” are not shown.

4.1.3 Availability and price of assessor services

While a range of evidence suggests that overall a sufficient supply of assessors was likely to be in place to meet ESOS' requirements, a large spike in demand close to the compliance deadline led to increased prices for assessor services, and a fall in perceived value for money.

ESOS was considered a good business opportunity by potential lead assessors, thus attracting them to the market and generating supply. They viewed the scheme as providing a 'hook' to offer further services to their existing client base as well as to target new clients⁴³. As a result, most assessors interviewed described themselves to be actively promoting their ESOS-related services – confirmed by organisations' reports of receiving considerable volumes of marketing activity from assessor firms.

Most of the assessors interviewed had a background in energy auditing and were linked to an energy accreditation register through existing affiliations to a professional body – providing them with a straightforward route to accreditation. However, in a small number of cases, assessors reported being driven in their choice of register by the cost of accreditation (reported to vary by register from £100 to £1000) or by the perceived potential for exposure to new clients.

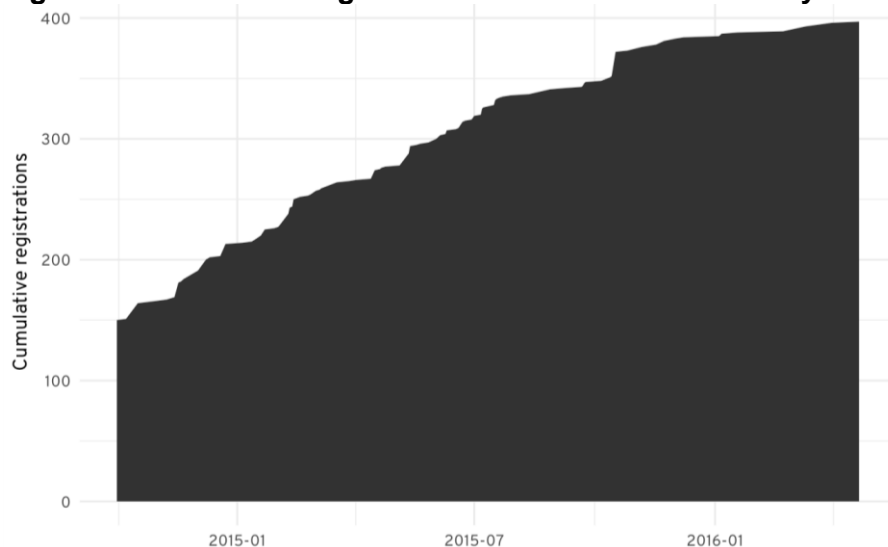
Evidence gathered through this evaluation suggested there was a sufficient overall volume of Lead Assessors to assist organisations in reaching compliance; at the time of the compliance deadline (December 2015), over 900 Lead Assessors were registered for ESOS, equating to 7.3 qualifying undertakings per Lead Assessor⁴⁴. This is an average, however, and therefore does not take account of differences in location or expertise of assessors or timing of demand (issues which are explored further later in this section).

Figure 4.2 shows the rapid increase in the volume of registered assessors from autumn 2014 when the register holders were approved. It also shows the volume of assessors continuing to increase, though at a slower rate, after the deadline during the grace period (there was ongoing demand for assessor services during this period from organisations delayed in starting their compliance activity).

⁴³ Two assessors engaged in the evaluation not seeking ESOS accreditation felt there would be insufficient demand to make the time and capital cost of accreditation worthwhile; a view based on experience of previous Government schemes such as the Green Deal they felt had not led to the anticipated level of demand.

⁴⁴ This is based on an estimated ESOS-obligated population of 6933 organisations, and 947 accredited Lead Assessors

Figure 4.2: Volume of registered ESOS Lead Assessors by date* (cumulative over time)



Source: Assessor register data, June 2016 (*based on partial data of 401 assessors listing registered date)

Concentration of the demand for these services in the last couple of months before the compliance deadline (as demonstrated in section 3.2.1) led to pressure on prices.

Figure 4.3 shows the average (mean) price paid for assessor services (as reported by surveyed complier organisations) in the run up to the compliance deadline in December 2015 and during the extended grace period in January 2016. The average price paid is shown to peak in January at £12,587; at double the price paid prior to October 2015 (£6,200)⁴⁵. Qualitative evidence from both assessors and organisations confirms that as the compliance deadline drew closer some assessors increased their prices as their capacity declined; one case study organisation returned to Lead Assessors for new quotes five months after originally gathering quotes, and found prices had increased from £1,000 to £3,000). The price increases described here are not out of keeping, however, with increases observed in other schemes providing energy efficiency services⁴⁶. Some assessors in the qualitative interviews also reported having to turn away ESOS work as the deadline approached that they would have been able to accommodate earlier.

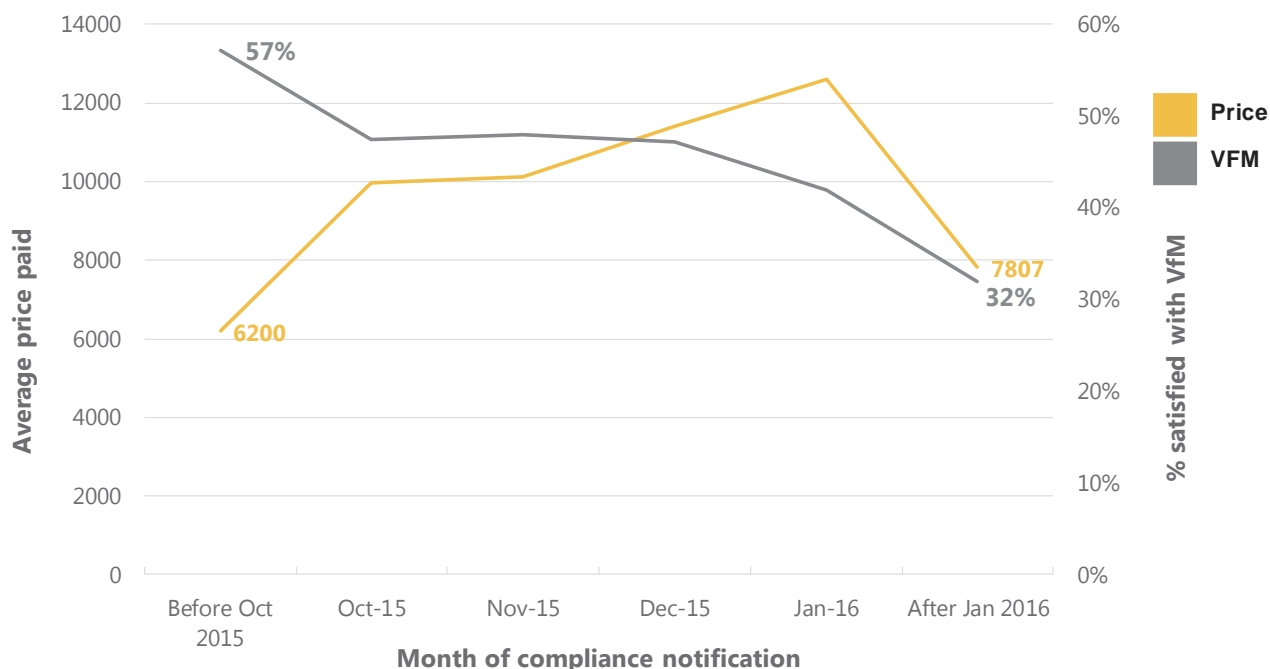
Figure 4.3 also plots price paid against perceptions of the value for money represented to complier organisations by their energy audit report; with price increases mirrored by falling value for money scores. Survey respondents describing themselves to be 'extremely

⁴⁵ The fall in price post January 2016 reflects a fall in demand following the end of the grace period.

⁴⁶ This is lower than price increases observed under the Carbon Emissions Reduction Target, for example: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/350722/CERT_CESP_Evaluation_FINAL_Report.pdf

dissatisfied' with the value for money offered by their report paid a mean of £12,993, compared to £10,428 overall⁴⁷.

Figure 4.3: Average price paid for assessor services by value for money over time



Source: ESOS evaluation survey data, 2016, Base: 610 compliant organisations who spent money on external consultant/ assessor services

4.2 Early signs of ongoing market effect for assessor services

Contributing to a longer-term focus on energy efficiency among organisations was an aim of ESOS as well as for assessors who wished to avoid cyclical demand for their services. Follow-up commissions for further energy assessment and consultancy have been limited to date, however, and it is likely that in some cases ongoing contracts may have been put in place anyway.

ESOS only mandates compliance through, for example, the procurement of an energy audit report or ISO 50001 certification. However, the scheme aims to contribute to longer-term effects (as described in section 2.1) which are likely to require a shift in levels of priority placed on energy efficiency by organisations and ongoing consideration and investment in energy efficiency measures. These impacts are likely to need ongoing support from a trusted and sufficiently developed assessor market.

⁴⁷ Although this relationship is not linear; respondents 'extremely satisfied' paid £11,863 on average.

Interviewed assessors saw the business opportunity potential in ESOS to extend beyond compliance-related energy audit activity to future longer-term contracts, including follow-up auditing, advisory services around the implementation and monitoring of recommended measures, energy management and reporting systems or software. One in six (16%) of all ESOS-obligated organisations surveyed have commissioned further work from their assessor; although qualitative evidence suggests at least some of this would have happened anyway as some organisations had pre-existing and long-term consultants in place, including those who had supported them through prior requirements, such as CRC.

Case-study evidence: drivers of follow-on work with assessors⁴⁸

A large firm had a long-standing contract with an energy consultancy (also leading their CRC compliance). The consultants had a significant role in leading ESOS compliance and are now following-up on a major area of recommendation related to capacity market auctions. Although the lead ESOS contact within the firm (the CFO) had relatively limited engagement in the ESOS report (during the evaluation interview they had limited recall of the recommendations made) the Lead Assessor consulted during the case-study reported that they planned to encourage the CFO to revisit other recommendations made (around heating and lighting, for example) at a later date.

By contrast, a smaller firm with limited prior engagement on energy efficiency (related to being an office-based firm with fewer than 250 employees but with a very large turnover of which energy-use was only a very small proportion) had no pre-existing relationship with an energy consultant and commissioned the cheapest available assessor (paying £2,500). The firm had limited engagement with the assessor during the compliance process (which only involved one brief site visit). In this case, no follow-up to implement the Lead Assessor's energy efficiency recommendations is planned or likely.

⁴⁸ Large firm: Complier, audit, advertising & marketing / Smaller firm: Complier, audit, oil & gas

5.0 Influence and impact of ESOS on organisational energy efficiency

This section considers what early signs of influence and impact are observable from ESOS. Based on the outcomes described in the Theoretical Framework, it explores the extent to which levels of organisational interest and priority for energy efficiency have changed, and evidence for implementation of energy efficiency measures, including transport related measures. The longer-term impacts detailed in the Theoretical Framework would be the focus of a later full impact evaluation.

Summary of ESOS influence and impact on organisational energy efficiency

ESOS is attributed by around four in ten complier organisations (including those who notified that they intended to comply⁴⁹) as having led to an increase in interest in energy efficiency, including at board-level. However, this was often reported by organisations that were already energy efficiency-conscious prior to the scheme. Similar changes in priority over the scheme period were reported by non-notifiers.

Since early 2015⁵⁰ a third of compliers surveyed (including those who intended to comply) had introduced or updated an action plan or strategy to meet energy efficiency goals (although not directly attributable to ESOS, this is higher than among non-notifiers).

Four in five (79%) complier⁵¹ organisations (i.e. those who had submitted a compliance or 'intend to comply' notice) reported some form of energy efficiency improvement in the 18 months prior to mid-2016. In turn, a third (33%) of these organisations, reported that ESOS had been influential in their decision to implement at least one of these improvements. A similar proportion of compliers (including those who intended to comply) who owned or leased vehicles reported implementing fuel efficiency improvements within this same time period (82%). Around one in five (22%) of these went on to attribute at least one of the fuel efficiency improvements to the influence of ESOS.

⁴⁹ This is based on 20 surveyed organisations which had submitted 'intend to comply' notifications by 26 August 2016.

⁵⁰ The time period being taken as the outset in ESOS activity for most organisations

⁵¹ For the purposes of this report, the term 'complier' is used, which denotes an organisation that submitted an ESOS compliance notification of compliance with the scheme, including those that stated 'intend to comply'.

Case-study evidence suggested that ESOS both identified new opportunities and flagged those of which organisations were already aware. In some cases, the ESOS compliance process resulted in the establishment of data-gathering structures which had not existed before, and which outlive the compliance process itself. Even in cases where energy efficiency improvements conducted since the start of the scheme may have been likely to come to fruition anyway, ESOS was attributed to have expedited the timing of the actions.

Given the fairly conservative assumptions made in the Impact Assessment⁵² as well as the early point at which impacts are being explored through this evaluation, an expectation of more widespread implementation of ESOS-led recommendations at the time of the survey (September 2016) would have been unrealistic. A later impact evaluation will explore the longer-term effects and issues of causality.

5.1 Context for assessing influence and impact of ESOS

5.1.1 Review of organisational starting point and scope for improvement

Analysis of the evaluation survey suggests there was likely scope for further action on energy efficiency among obligated organisations prior to ESOS: reported priority on energy efficiency at the outset of the scheme was low; significant numbers of organisations had no energy use goals; and prior action had mainly focused on lighting.

To consider the scope for ESOS to impact organisational energy efficiency policy and practice, this section first of all considers the pre-ESOS levels of priority, spending and action on energy efficiency reported by surveyed organisations⁵³:

- **Priority levels:** Survey findings show that energy efficiency was not a high priority for organisations before they began the compliance process. Respondents rated their organisation's overall level of priority on energy efficiency (at the start of 2015) to be around 5 out of 10⁵⁴ on average (with a similar level reported for board-level interest specifically).

⁵² The European Commission Impact Assessment (2011) calculated savings of between 0.4% and 5% of total energy demand (central estimate of 3%). The ESOS Impact Assessment, acknowledging the related UK policies already in place, estimated the impact in the UK to be towards the lower end of this range.

⁵³ Findings on pre-ESOS context are all based on the full sample of organisations: compliant, intend to comply, and non-notifying, unless otherwise stated.

⁵⁴ Where a score of 1 out of 10 represented a very low level of priority and a score of 10 a very high level.

- **Action plans and goals:** Around two in five organisations had energy efficiency goals or processes in place prior to ESOS. Around a third of organisations overall had an action plan on energy efficiency (most commonly amongst the largest organisations).⁵⁵
- **Policies and regulations:** The majority (69%) of organisations were participating under at least one other energy related scheme; most commonly the Climate Change Levy (38%), Energy Performance Certificate (EPC) (37%), and the CRC Energy Efficiency Scheme (29%).
- **Installations:** Many organisations in scope of ESOS had installed energy efficiency measures in the five-year period prior to ESOS with action primarily on lighting efficiency (59% of organisations). Case studies, including a review of these organisation's ESOS audit reports, suggested that there was scope for further savings to be generated through action on measures such as heating changes, hot water, cooling or ventilation systems, or changes to building fabric or processes.
- **Fleet composition and management:** Survey evidence suggests there is scope for greater use of low carbon vehicles in transport fleets. The majority of ESOS obligated organisations surveyed owned or leased vehicles for commercial use (72%). While 49% had fleets that included low carbon cars, in nearly three in ten cases (29%), this applied to less than a quarter of their total car pool. Overall, 9% of car owning organisations and 4% of LGV owners reported their full fleet to be electric or low carbon.

5.1.2 Review of ESOS Audit Recommendations

A key effect acting on ESOS' impact to date is the current stage at which organisations are in their review and consideration of ESOS recommendations. This varied, although for most, at the time of the research, audit reports had not been circulated widely within organisations using this route and there was relatively little evidence to suggest action was likely to happen soon.

By mid-2016, almost all compliant organisations surveyed reported having received their final energy audit report (97%), and on average spent between seven and eleven hours⁵⁶ reviewing and signing off the reports. Case study evidence suggests that the amount of time spent by board-level staff on this process was only a small proportion of this, however; board members were generally reported to have spent between 15 minutes and an hour reviewing the report and in some cases, were very unengaged. Compliant

⁵⁵ This represents the minimum number of organisations with policies such as these prior to ESOS; the question does not separate policies which were in place before ESOS but have been updated since from policies introduced since ESOS.

⁵⁶ The median and mean number of hours recorded by complier organisations surveyed.

organisations also spent seven person hours on average⁵⁷ considering whether, and how, to implement recommendations from the ESOS process. There was a high amount of variance, however – around one in eight (12%) organisations reported that they spent an hour or less, while six organisations had spent 60 days or more on this process.

The case studies also suggested there was limited dissemination of the ESOS reports beyond the lead contact which may inhibit the adoption of recommendations by non-audited sites or other parts of the corporate group. There was limited evidence of organisations having referred back to their reports following compliance. In some cases, there was very poor recall of the contents of reports, while in others, organisations struggled to locate their ESOS report, suggesting low engagement.

Case-study evidence: Review and circulation of ESOS audit reports

In most case-studies, a member of the board had signed off the report, as per the regulation, but had not engaged extensively. In some cases, this was because ESOS was seen as a compliance exercise. Once the board had been informed of compliance, they were felt to need no further involvement. In some cases, short 'review' slots were booked with board members for sign off.

“The board thought of this [ESOS compliance] as just an overhead, a back-office activity”

Complier, audit, advertising & marketing, Chief Financial Officer

Lack of attention from the board should not, however be considered a firm indicator of lack of impact. The ESOS lead contact (who was appointed as their internal ESOS Lead Assessor) in one case study organisation, reported that their board did not need or want to see the detail of the report, but rather was satisfied to know that ESOS was being taken care of by those whose job it was to engage and implement findings.

“[The audit report length was informed by] who I had to present it to. [My manager] advised on what we should include, what an MD wants to hear. We had to listen to our audience. Our actual compliance report doesn't tell you anything. Otherwise it would have been a 300-page report - we have all that as a spreadsheet.”

Complier, internal audit, manufacturing, other employee

⁵⁷ Based on median figure, mean was 26 hours

In another case study the firm did do more on dissemination. The relevant reports were circulated to the appropriate site managers to help them understand recommendations and what the findings meant to their site. The main report was presented to the executive team by the ESOS contact. However, there were no examples of widespread dissemination of the report to staff.

“Staff don’t care that we’re legally compliant...they worry about train delays, passenger satisfaction and all sorts. They aren’t interested in legal compliance”

Compliant, ISO 50001, Transportation and storage, Health & safety

5.2 Influence of ESOS on energy efficiency policy and priorities

ESOS is attributed by over four in ten complier organisations (including those who intended to comply) as having led to an increase in interest in energy efficiency, including at board-level. Attribution of changes due to ESOS, however, often came from organisations that reported giving energy efficiency a priority before ESOS. Similar changes in priority over the scheme period were also reported by non-notifiers.

While a key aim of ESOS is to identify energy saving opportunities and encourage related action, it is also hoped that the scheme encourages a heightened level of interest in, and priority on energy efficiency and the establishment or tightening of longer-term strategies and policies within businesses. It is hoped that this will mean energy efficiency takes a more prominent position in decision-making and in investments on a persistent basis. Therefore, this study explored any changes since ESOS in both energy efficiency interest, behaviour and action.

More than four in ten complier organisations (including those who intended to comply) reported that ESOS had led to an increased level of interest in energy efficiency for their organisation overall (44%) and at board-level (43%). This is a self-reported measure, however, which does carry the risk of impacts from ESOS being overstated.

Compliant organisations that reported their board or organisation placed a high level of priority on energy efficiency prior to ESOS, were among those most likely to report that ESOS itself had led to an increase in interest; suggesting ESOS may have helped keep or push energy efficiency agendas primarily among those who were already interested.

Organisations following either an ISO 50001 route, or using an internal assessor⁵⁸ were also more likely than those completing externally commissioned energy audits to agree that ESOS had led to an increase in interest in energy efficiency, at both a board and overall organisational level.

Conversely, there was evidence to suggest that some more energy intensive organisations, or those which were active on energy efficiency prior to ESOS, were less likely to attribute any increase in interest in energy efficiency to ESOS; confirming expectations set out in the Impact Assessment⁵⁹. This is true of those already complying with CRC or EU ETS, where 26% and 27%, respectively, strongly disagreed that there had been an increase in interest in energy efficiency for their organisation overall, compared to 19% of compliers, including those who intended to comply. Manufacturing firms, which the qualitative research found were likely to be more focused on these issues already, were also more likely to disagree with this.

It is also important to note that all those surveyed (including non-notifiers) were also asked to rate the priority placed on energy efficiency in their organisation, at both board and organisational level. A rating out of ten was given for the start of 2015 (pre-ESOS) and at the time of the survey (September 2016, after the compliance deadline). While 44% of complier organisations (including those who intended to comply) reported the priority level to have increased over this period, increased priority was also reported by a similar proportion of non-notifiers⁶⁰.

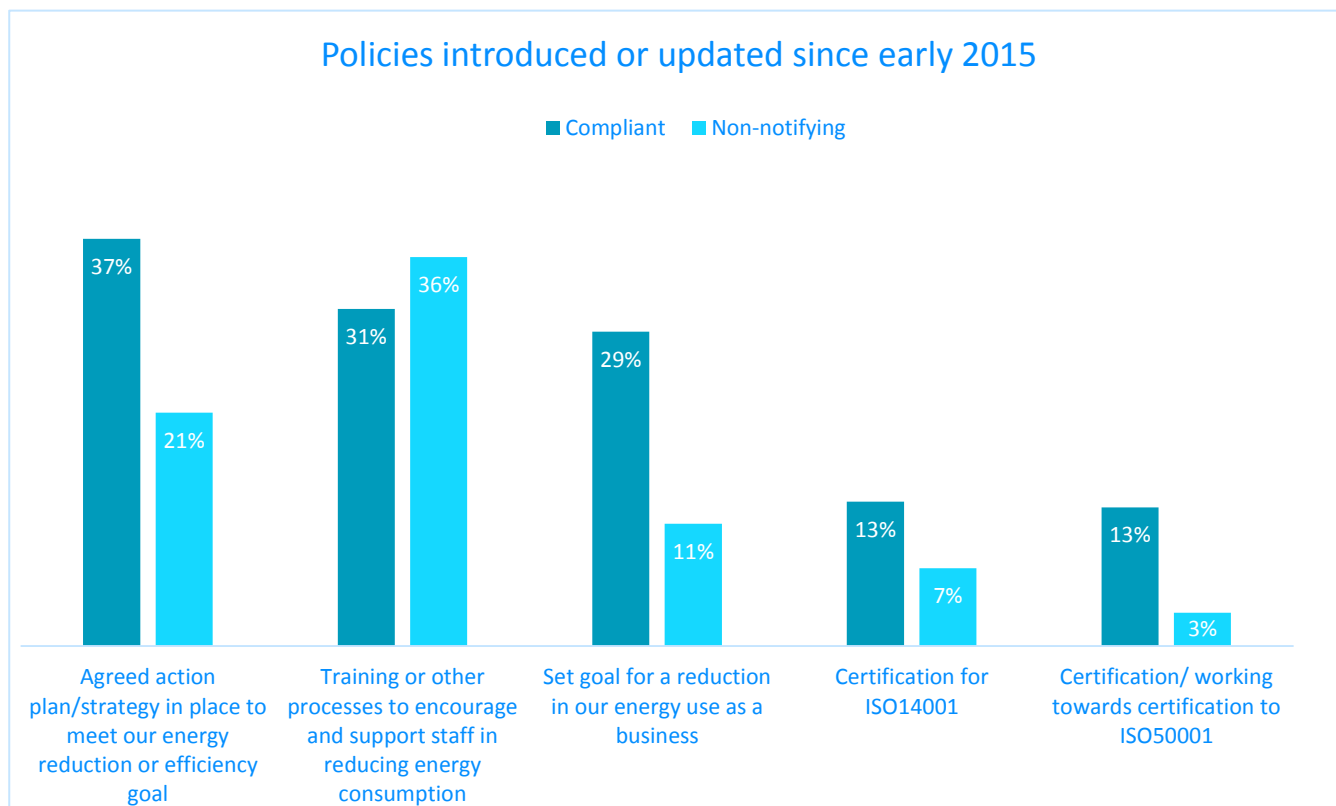
As shown in Figure 5.1, the introduction and updating of energy policies and action plans since early 2015 was, however, more frequently reported by compliers than non-notifiers (although this cannot necessarily be attributed to ESOS). By mid-2016, over a third (37%) of complier organisations had introduced or updated an action plan or strategy in place to meet energy reduction or efficiency goals (higher than the 21% of non-notifying organisations). Actions had included staff training on energy efficiency and goal setting (with the latter again significantly more likely in compliant (29%) than non-notifying organisations (12%)).

⁵⁸ Already reported to be among the more engaged in energy efficiency prior to ESOS.

⁵⁹ Stating that the “ESOS assessment will have a lower impact on energy intensive enterprises as the information market failures are likely to be less significant in these sectors”.

⁶⁰ The non-notifier group cannot be treated as a counterfactual – they are likely to differ to the compliers in observable and unobservable ways and as discussed in Section 6 of this report, in some cases they incurred costs in the compliance process.

Figure 5.1: Energy efficiency policies introduced or updated since early 2015



Source: ESOS Evaluation survey, 2016, Base: 821 compliant organisations, 50 non-notifying organisations

Qualitative evidence did suggest that ESOS may have positively influenced other aspects of organisational processes that could contribute to more conducive environments for energy efficiency focus or actions. For example, the scheme requirements to report on at least 90% of the organisation’s energy use, forced some organisations, particularly those with complex or multi-site operations, to liaise closely with other parts of their wider business to collate and understand energy usage across their full portfolio. These requirements led to some energy uses being measured in detail for the first time for some organisations – bringing with it first sight of new potential areas of energy and cost saving. It also gave rise to new processes in some organisations for recording this information.

Case-study evidence: impact of ESOS on organisational processes

A transport company⁶¹, complied via ISO 50001, already had a comprehensive energy management system in place pre-ESOS. However, ESOS helped them

⁶¹ Compliant, ISO 50001, Transportation and storage, Health and safety, Yorkshire and the Humber

to realise that they did not gather or monitor energy usage data on a site-by-site basis, which they then instigated.

“ESOS was instrumental in bringing company-wide information into one place”

Impact of ESOS on goal-setting

An energy-intensive manufacturing sector organisation with a factory (including coke-fired furnaces) in Wales and administrative head office in London already reported that it placed a high level of priority on energy saving measures - energy use at their manufacturing plant was closely monitored each week.

Despite initial reservations about the value of the policy for them, the ESOS audit process and report gathered new information, and identified a number of new energy saving ideas – such as at their office sites and for their company car fleet which had been previously overlooked.

The organisation reported having already enacted the following recommendations from their ESOS process: Setting a new energy efficiency target including electricity and gas use within the head office as well as the factory site; and a commitment to review their company car policy and to phase out less efficient vehicles.

5.3 Implementation of savings opportunities and attribution to ESOS

ESOS was reported as an influence by a third of complier organisations (including those who intended to comply) making any given energy efficiency improvement, and by a fifth making any fuel efficiency improvement, since early 2015; smaller numbers of these organisations attributed specific measures they had installed directly to recommendations received through ESOS. Given organisational timescales for implementing change (and relatively conservative assumptions made in the Impact Assessment) more widespread implementation of ESOS-led recommendations was not reported at the time of evidence collection during 2016.

Based on a review of the ESOS energy audit reports obtained from organisations involved in the case-study visits, the following types of recommendations were being made by Lead Assessors:

Review of types of recommendations included in ESOS reports:

Improved monitoring or information quality, e.g. to better understand levels of usage and identify energy expensive or faulty machines or processes

Zero-cost e.g. control-optimisation to reduce out-of-hours usage, prevent simultaneous heating and cooling, e.g. sensors to switch off hot air circulation heating system when workshop doors are opened

Behaviour change (low cost – staff time, training) e.g. energy data analysis, more efficient IT equipment use, staff training to turn off machines when not needed / over the weekend

Quick payback (<6 months) e.g. installing timers or occupancy sensors, repositioning thermostats, fixing compressed air leaks and other wastage

Larger investments e.g. LED lighting (3-4 year payback), heat recovery from industrial processes for space heating, switching power generation for specific processes from a diesel generator to direct grid power

Transport measures e.g. 'good driving practice' policy, rewards for staff using public transport/cycling, improved focus on vehicle maintenance.

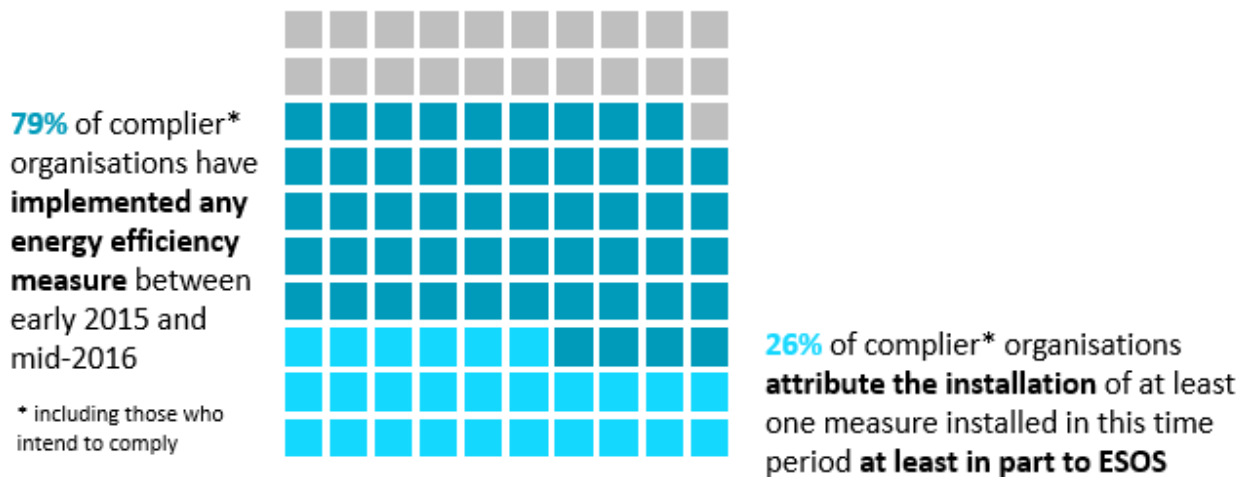
The following sections consider uptake of specific energy and transport-related measures and the impact of ESOS to date on these actions.

5.3.1 Uptake of energy efficiency measures

Since the commencement of ESOS compliance activity⁶² a large proportion of complier organisations (including those who intended to comply) have implemented energy efficiency improvements (79%). Among those reporting taking energy efficiency action in the last 18 months up to mid-2016, a third (33%) attributed at least one of these actions at least in part to ESOS (this equates to 26% of compliers overall having taken some action influenced by ESOS by mid-2016). This is shown in Figure 5.2 below.

⁶² Defined as the start of 2015

Figure 5.2: Implementation of, and impact of ESOS on, energy efficiency measures



Source: ESOS Evaluation survey, 2016, Base: 821 complier or intend to comply organisations

During the survey, the actions of complier organisations (including those who intended to comply) was also explored at a detailed measure-level. Organisations were shown a list of categories of energy efficiency measure that they may have taken – for example, measures related to lighting or heating, computers and IT solutions or to the building fabric. For each category of measure that an organisation had made energy efficiency improvements in, they were shown a more detailed list of specific measures within that category to understand the specific improvements they had made. For example, if they had made improvements to lighting, they would be asked if they had installed a variety of different types of lighting, or if they had made improvements to heating, they were asked if they had installed a new boiler, or building management system, among other measures.

As shown in Table 5.1 below, four in five (79%) compliers (including those who intended to comply) have installed any type of energy efficiency measure in the 18 months up to mid-2016, and most commonly this has been a lighting measure or an improvement related to heating or computing. It is important to note, however, that non-notifying organisations have also taken action during this period, and for some categories, action is more prevalent amongst these organisations (for example, 54% of non-notifiers have made changes to heating systems, and 38% have made changes to building fabric, since early 2015).

For each of the individual measures within the categories listed in Table 5.1, organisations were asked whether they had made this specific improvement directly as a result of an ESOS recommendation, or in part due to ESOS but in part due to other factors. Table 5.1 shows the percentage of individual measures within each category that had been influenced either directly or partially by ESOS. It shows that, as well as lighting measures

overall being most commonly introduced since early 2015, specific lighting improvements were also the types of energy efficiency improvement most likely to have been directly related to ESOS (9% of the specific lighting measures installed by compliers were attributed directly to ESOS). By contrast, hot water system improvements were less likely to have been undertaken because of ESOS (2% of specific hot water system improvements were directly attributed to ESOS).

Table 5.1 Energy efficiency action by complier/ITC organisations, since early 2015

Any EE action taken within category... (base, 821)	% Installed any measure in category since early 2015	Of which: % individual measures within category attributed to ESOS recommendation	
		Directly attributed to ESOS	At least partly attributed to ESOS
Lighting	59%	9%	28%
Heating system	37%	6%	21%
Computers & IT solutions	36%	4%	11%
Processes	29%	5%	24%
Cooling system	28%	5%	25%
Building fabric	24%	7%	18%
Hot water system	24%	2%	13%
Ventilation system	22%	6%	24%
Installation of any energy efficiency measure within any of the above categories	79%	-	-

Source: ESOS Evaluation survey, 2016, Base: 821 complier or intend to comply organisations

Analysis of the data at a specific measure-level (rather than at a category-level as presented in Table 5.1 above), shows that between two and twelve percent of compliers reporting action since early 2015 attribute specific measures directly to recommendations received through ESOS (for more information see the accompanying survey data tables). The most commonly cited of these were related to lighting: replacing external lighting with LEDs (12% directly attributed to ESOS); and replacing internal fluorescent or incandescent/tungsten lighting with LED (10%). Of all of the actions fully or partly attributable to ESOS, the most common were: installation of heating recovery (31%), and lighting measures, specifically replacing internal lighting with LED (30%) and installing lighting controls, time switches, discrete or centralised controls (29%).

Case-study evidence suggested that ESOS was producing its effects on organisations through the identification of both opportunities that were new and previously unknown to

organisations, as well as opportunities which organisations were already aware of. In cases of the latter, organisations reported that ESOS provided useful ‘external verification’ of potential savings, added impetus, and gave them license to fully scope out options and recommend implementation plans.

“We were aware of some of these things but having them put down in the black and white on the report was useful.”

Complier, audit, manufacturing, procurement

A few of the case-study organisations reported ESOS, as a result, to have allowed internal energy efficiency teams to make more effective cases for organisational resources to pursue these actions. Although it was considered likely that the energy efficiency improvements conducted since the start of the scheme would have come to fruition anyway, ESOS was attributed to have expedited the timing of the actions.

“Having the ESOS requirement to meet meant we had the resource in place to look into these [energy saving plans they had already identified] properly and action them”

Complier, audit, construction, Operations Director

Case study evidence: energy efficiency measures installed and extent to which influenced by ESOS recommendations

In one financial and insurance activities company⁶³, ESOS had led to small scale investments, such as upgrading lighting. The respondents felt that ESOS was a catalyst for this upgrade, but that it would have happened anyway in time in the absence of ESOS.

One manufacturing company⁶⁴ has installed sensors on workshop doors to switch off hot air heating when the doors are open. These have been rolled out across all UK sites and are now being considered for global roll-out by the American parent company. This opportunity was identified during the course of ESOS energy audits, but as ESOS was incorporated into a wider programme of energy review by the internal auditor, this internal representative of the organisation felt it probable that this would have happened without ESOS.

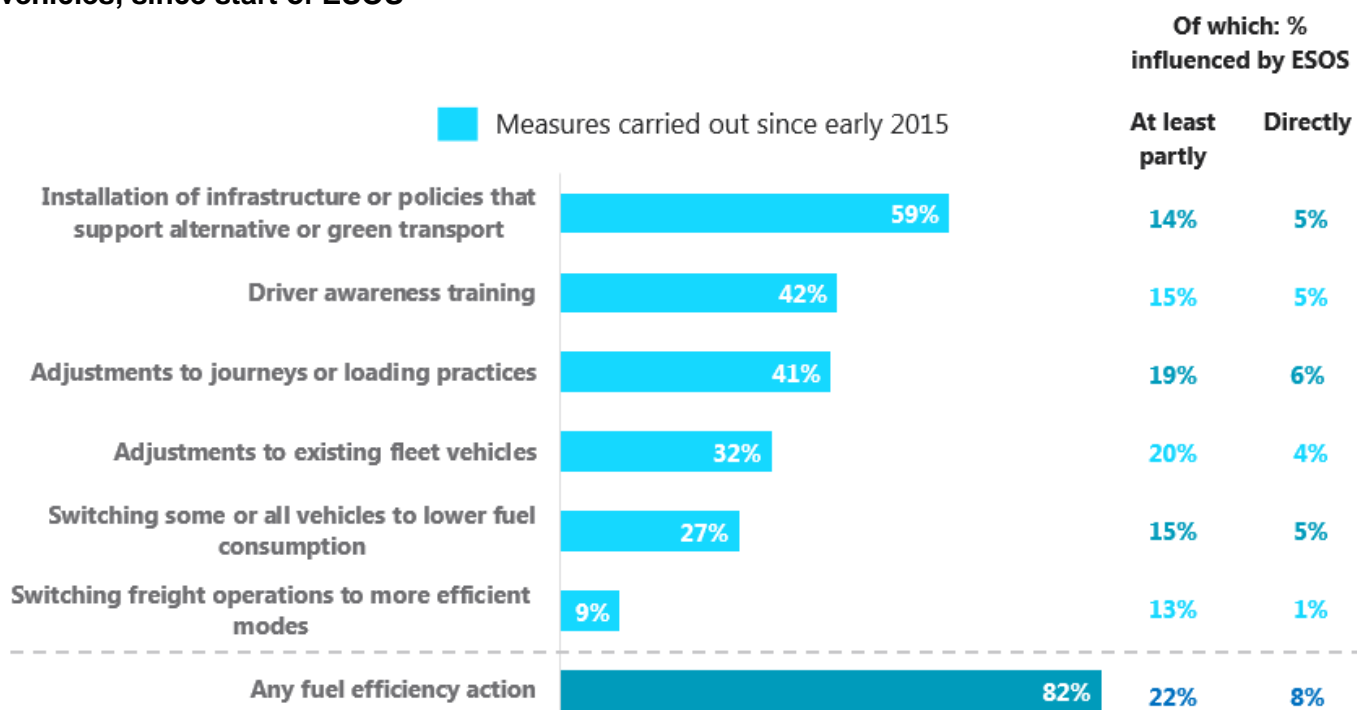
⁶³ Compliant, audit, Financial and insurance activities, Facilities department, North West

⁶⁴ Complier, internal audit, manufacturing, other employee, East Midlands

5.3.2 Uptake of fuel efficiency measures

A large proportion of complier organisations (including those who intended to comply) which own or lease vehicles have implemented fuel efficiency improvements since the start of the ESOS period (82%). Around one in five (22%) who have implemented such improvements attributed at least one of them to have been influenced by ESOS, and 8% attributed at least one improvement directly to recommendations received through ESOS. As shown in Figure 5.3, specific fuel efficiency measures which had been implemented were said to have been influenced by ESOS in between 13% and 20% of cases; with between four and six percent of most improvements directly attributed to recommendations received through ESOS.

Figure 5.3: Fuel efficiency action taken by complier/ITC organisations that own or lease vehicles, since start of ESOS



Source: ESOS Evaluation survey, 2016, Base: Complier or intend to comply organisations who own or lease vehicles (608)

The case-studies suggested that there were variations in the level of influence ESOS had on the uptake of transport improvements in line with the assumptions in the Impact Assessment⁶⁵, as well as the level of engagement transport-related staff had with the ESOS process:

⁶⁵ No impact on energy consumption was assumed on rail, aviation, shipping or business travel in household-owned cars, with 1% reduction estimated by vans, heavy good vehicles and buses & coaches, and 2% for business travel in company car fleets.

Case study evidence: impacts of ESOS on fuel efficiency measures

One organisation⁶⁶ with a large transport fleet received recommendations such as reducing tyre pressures and eco-driving practices; resulting in a programme of communications to encourage behaviour change amongst drivers.

Example of transport-related improvements without influence of ESOS

An accident management company with a large transport fleet (making up 89% of total energy expenditure) has implemented transport specific initiatives, including an incentivised driver education programme with monthly monitoring of fuel usage; fleet choices based on fuel consumption and charging points installed at offices to encourage use of hybrid vehicles. These actions were not motivated by ESOS, however; the report did not make these specific recommendations (due to compliance being undertaken at the lowest possible cost) and the Transport Director had limited awareness of the ESOS process as they had not been involved or consulted during the compliance activity period.

5.3.3 Intended sources of investment for energy efficiency measures

Energy efficiency spend appears to be ring-fenced in many complier organisations (including those who intended to comply) although where it is anticipated that any investment in ESOS-recommended measures would displace other intended investments, these are not usually energy efficiency related.

Complier organisations (including those who intended to comply) anticipated that any budget they obtained for implementing ESOS-recommended energy efficiency or transport-related measures was most likely to be entirely new investment (57%) rather than being taken from investment earmarked for other things. More than a third (37%) anticipated that any investment would partially replace other intended investments, while 6% expected it to fully replace other intended investments. Among those anticipating future energy efficiency investment to either fully or partially displace other intended investments, only 12% of organisations thought this would be other energy efficiency projects. The majority (83%) thought that other non-energy related projects would be displaced (which in theory could have the potential to raise firm productivity in other ways).

⁶⁶ Compliant, audits, Other service activity, Facilities, London

5.3.4 Ongoing barriers to uptake of ESOS recommendations

Financial barriers and uncertainty over costs and benefits remain the most prevalent barriers to uptake of ESOS measures.

More than two in five complier organisations (including those who intended to comply) cited lack of funding or finance as a barrier to uptake of the energy efficiency measures recommended to them through ESOS while 14% cited uncertainty about long-term benefits and costs. Given the scale of the turnover of ESOS-obligated organisations, and the broad range of financial commitment required for changes recommended in the energy audit reports, it is the view of the evaluation team that the citation of finance as a barrier is likely to reflect a lack of appetite for energy efficiency action among these organisations, rather than genuine financial market constraints. Case-studies with office-based organisations found that this uncertainty often stemmed from a belief (not changed through the ESOS process) that there was relatively limited energy efficiency action possible – or where it was possible it would offer little in the way of financial reward - within their operational environment.

Case-study example: Lack of belief in energy efficiency recommendations

An office-based organisation in the advertising and marketing sector had not engaged with the recommendations in their energy audit report due to a pre-held belief that energy efficiency actions would not be possible, or effective in cost-saving terms, for their firm. This was despite their audit report recommending improvements offering the potential of around £70,000 in cost saving from an outlay of £1,500. The potential saving figure presented in the report was not considered credible, and at the time of the interview the organisational representative had limited recall of the recommendations set out in the report. This reaction was not based on any experience of energy saving measures proving ineffective in the past, but instead was an intuitive belief held strongly by this respondent.

“At the end of the day, what can you do in an office space?”

Complier, audit, advertising & marketing, Chief Financial Officer

The case-studies suggested that a further barrier was having the staff resource and skills in place to implement recommendations:

“[Implementing ESOS recommendations] seems like a no-brainer on paper, but it's how it fits with the workload of the already overstretched engineering department, and it's getting contractors in to do it.”

Complier, audit, manufacturing.

6.0 Costs of ESOS compliance

A key principle in ESOS' design was to minimise the resource and financial burden on in-scope organisations. This section assesses the extent to which this objective has been achieved against cost assumptions made in the initial Impact Assessment. A fuller assessment of the benefits of compliance would be included in any longer-term impact and economic evaluation of ESOS commissioned by BEIS.

Summary: extent to which ESOS has minimised the cost to business

The evaluation evidence suggests that overall costs of compliance were in line with those anticipated in DECC's initial Impact Assessment.

Organisational time costs associated with ESOS compliance have been lower than those anticipated in the Impact Assessment; 15 days⁶⁷ was reported on average.

Four in five ESOS-obligated organisations (80%) incurred additional external costs; the total value of which exceeds estimates in the Impact Assessment. On average, obligated organisations incurred between £6,150 - £14,388 additional external expense; the most common being assessors' services at an average cost of between £7,000 - £10,579.

Evaluation evidence suggests ESOS has placed no more burden on obligated organisations than was anticipated in the Impact Assessment (with a significantly lower internal resource burden offset by the higher external costs). However, qualitative evidence suggests some organisations did consider it burdensome, particularly those who had not previously collated the necessary energy and fuel data or who considered the scheme as a regulatory exercise rather than energy saving opportunity or felt they had not received sufficient value for money from their assessor's outputs.

6.1 Internal costs of compliance

ESOS-obligated organisations surveyed spent 15 days on average internally responding to the scheme. Some did spend longer, particularly where they had

⁶⁷ This is the unweighted median across all ESOS-eligible organisations surveyed. The mean figure is 28 days which reflects some significant outlying values. Unless otherwise stated, all figures reported in this section are median values. All staff time, and external costs, presented in this report are based on self-reporting by obligated organisations

complex organisational structures and had not previously collated their energy and/or fuel usage information.

Respondents to the survey were asked to report the level of staff time spent on each stage of the ESOS compliance process. Across all those surveyed, the average reported time spent overall on the scheme was 15 days. For complier organisations, the median was 16 days compared to just two hours for non-notifying organisations.

Time costs incurred were generally greater for larger organisations; those with more than 10,000 staff spent almost twice as long on compliance (24 days) compared to those with fewer than 1,000 staff (13 days); and those with a larger turnover (over £50million) spent over twice as long on compliance (18 days) compared to those with a turnover of less than £25m (8.5 days). There was no difference between the time spent to comply through either energy audit activity or through ISO 50001 certification.

The most time-intensive stage in the compliance process was supporting the ESOS assessor, which the qualitative research found reflected the time taken to request, collate and present energy and fuel consumption data and any other company information required by the assessor, as well as accompanying site visits. This was most time-consuming for organisations that did not already have a process in place to collate their energy usage information regularly or who had to request information from internal departments or third party organisations (such as building managers or suppliers).

Figure 6.1 – Average internal time spent at each stage of ESOS process (in days)⁶⁸



Source: ESOS Evaluation survey, 2016, Base: 871 in-scope organisations (unweighted)

6.1.1 External costs of compliance with ESOS

Four in five ESOS-obligated organisations surveyed (80%) incurred additional external costs as a result of the scheme. On average, obligated organisations reported an £6,150 additional external expense; the most common being assessor’s services for which £7,000 was paid on average.

The average total additional external costs reported (that would not have been spent by organisations in the absence of ESOS) was £6,150 (based on the median figure, with a higher mean cost of £14,388). Table 6.1 provides a breakdown of reported external expenditure. As shown in Table 6.1, the most commonly incurred external cost was for assessor services. As discussed in section 4.1.3, this cost varied depending on the timing of commissioning assessor services (doubling between October 2015 and January 2016).

⁶⁸ The final statement shown in Figure 6.1 represents time reported by organisations that is not part of their cost of compliance; considering the implementation of ESOS recommendations is a voluntary element of the scheme.

Table 6.1 – External costs incurred during ESOS compliance process

Area of expenditure	Average spend (all organisations*)	Bottom and top-end spend	% spending nothing in this area (incl. Don't Know responses)
External consultant/ assessor services	£10,579 (mean) £7,000 (median)	Min - £200 Max - £200,000	29%
Training – internal assessor	£3,295 (mean) £2,000 (median)	Min - £250 Max - £30,000	96%
Software (*only compliers recorded this cost)	£9,482 (mean) £3,000 (median)	Min - £800 Max - £50,000	98%
Energy monitoring equipment/ hardware (*only compliers recorded this cost)	£76,655 (mean) £4,000 (median)	Min – £200 Max - £100,000 (£450,000 and £2,000,000 outlier)	96%
Other (e.g. other training, equipment, certification, travel expenses)	£13,475 (mean) £3,000 (median)	Min - £100 Max - £250,000	94%
Average total external spend	£14,388 (mean) £6,150 (median)	Min - £100 Max – £1,989,000	

Source: ESOS Evaluation survey, 2016, Base: 871 in-scope organisations (unweighted values)

Larger organisations spent significantly more commissioning assessor services (£10,000 compared to £5,000 on average for multi-site compared to single site organisations; and £20,000 compared to £5,000 for organisations with 10,000 employees compared to 500 employees).

Compliant organisations were significantly more likely than non-notifiers to have incurred additional external costs (86% compared to 22% of non-notifiers). Among non-notifying organisations incurring costs, the vast majority of this was spent on external lead assessor services; an average of £5,000 was spent by these organisations on such services. Other external expenditure reported by non-notifiers surveyed was to cover accommodation and

travel costs (potentially to attend ESOS roadshows or other events run to spread awareness and understanding of the scheme and its eligibility criteria).

6.2 Minimisation of burden

Evaluation evidence suggests ESOS has placed no more burden on obligated organisations than was anticipated in the Impact Assessment; with a significantly lower internal resource burden offset to an extent by higher than expected external costs. However, qualitative evidence suggests some organisations did consider it a burden, often linked to whether the scheme was considered a regulatory exercise or a longer-term energy and cost saving opportunity.

Costs reported by ESOS-obligated organisations– including internal staff time (in days) and external expenditure – have been analysed to understand the overall costs incurred on organisations by the scheme. These costs have been estimated in line with the principles of the Standard Cost Model, with average reported costs grossed up to the estimated size of the obligated population (6,933 organisations). The cost of staff time has been monetised at an average hourly pay rate of £13.67 as derived from the Annual Survey of Hours and Earnings.

As shown in Figures 6.2 and 6.3, the total costs incurred by ESOS-obligated organisations is within the range of £49m to £101m, with the lower estimate based on median values and the upper estimate based on mean values (which are influenced by some significant outliers – particularly in relation to costs for additional energy monitoring equipment required). The total internal time costs within this are valued to be in the range of £10.7 million to £19.9 million (again depending whether based on median or mean reported staff time). The most significant external expenditure has been on external assessments, valued to be in the range of £34.5 million to £52.1 million.

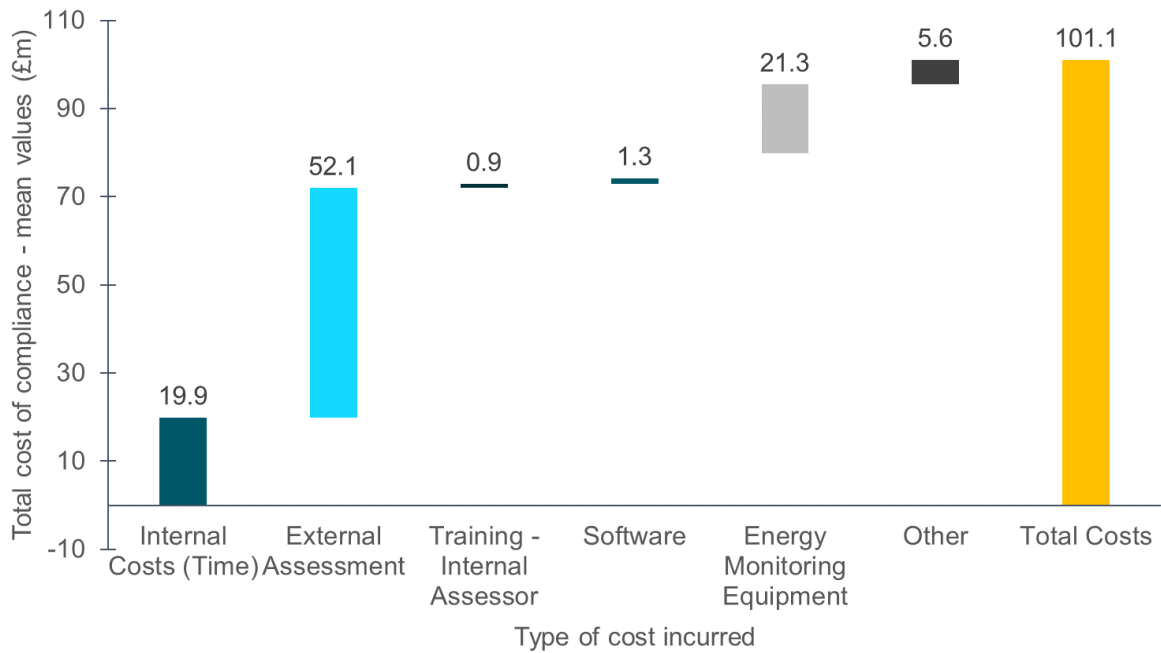
These calculated costs of compliance (based on reporting by surveyed organisations), are comparable to those presented in the ESOS Impact Assessment⁶⁹; the £73.8 million total cost estimated (once re-scaled to an updated assumption on the size of the obligated population and taken for one ESOS cycle) falls within the £48.6 to £101.1 million range estimated from the evaluation evidence. As shown in Table 6.2, while reported external costs outstripped the estimation (by £7 million when compared against median values, but by nearly £50 million when compared against mean values), this is offset by a lower than

⁶⁹ Based on selected Policy Option 2: mandatory notification of compliance with an option of further voluntary disclosure.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/323116/ESOS_Impact_Assessment_FINAL.pdf

6.0 Costs of ESOS compliance

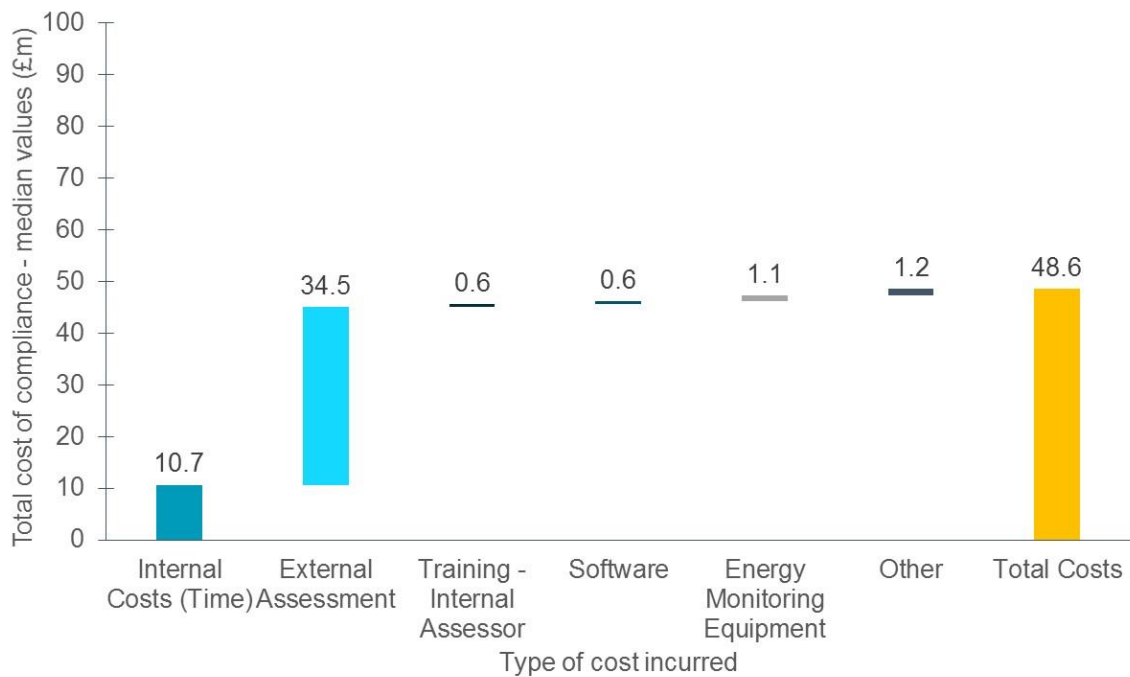
anticipated internal cost of compliance; the evaluation's estimation is between £22m and £32m lower than estimated.

Figure 6.2 – ESOS costs of compliance by type of additional cost incurred (mean values)



Source: Ipsos MORI

Figure 6.3 – ESOS costs of compliance by type of additional cost incurred (median values)



Source: Ipsos MORI

Table 6.2 – Assessment of compliance costs against Impact Assessment estimates

	Impact Assessment estimate (Based on 4 ESOS cycles to 2030)	Impact Assessment (scaled to 1 ESOS cycle & re-estimated population size)	Ipsos MORI estimate (median cost values)	Ipsos MORI estimate (mean costs values)
Assessment cost ⁷⁰	£165m	£30.4m	£37.4m	£80.2m
Admin Burden ⁷¹	£235m	£43.3m	£11.2m	£20.8m
Approximate total	£400m	£73.8m	£48.6m	£101.1m

Source: Ipsos MORI

This analysis suggests ESOS may not have placed more burden on obligated organisations than anticipated in the Impact Assessment. However, the evidence gathered through this evaluation suggests that external costs were potentially inflated by the compression of demand into the final months of the scheme (driven largely by delay on the part of obligated organisations, as awareness raising activities proved effective). There may be options for delivering future communications around the policy that could support a smoothing of demand in any later compliance rounds to minimise the resource costs incurred by obligated parties.

Qualitative evidence suggests organisations less likely to perceive ESOS as burdensome included those who:

- Sub-contracted significant elements of the ESOS process to an external consultant, including, for example, giving them authority to approach energy suppliers to gather usage data on the company's behalf, and completing the notification form.
- Participated in other energy reporting schemes (for example, CRC). While these organisations, on average, did not report spending less internal time on ESOS (potentially related to these organisations often being larger and across multiple sites), the process of participating in ESOS was considered more straightforward, and so less burdensome as they had experience of collating and recording the information required (or had consultants in place already who did this for them).
- Used ESOS as a trigger to pursue energy use analysis or investigate energy saving opportunities which they had previously considered but had not been able to conduct (either due to lack of time or resource or lack of priority placed on these

⁷⁰ External assessor costs, plus software, monitoring equipment and other costs.

⁷¹ Internal staff time costs plus internal Lead Assessor training costs

activities by the organisation prior to ESOS) – in some cases this included pursuing ISO 50001 certification.

7.0 Conclusions

This section sets out the main conclusions from this process evaluation of ESOS, examining how far the policy met its four core policy objectives.

7.1 Minimisation of Compliance Costs

BEIS, the Environment Agency and other partners have put in place a process for compliance with the ESOS regulations that so far has in many respects been effective in maximising compliance rates while minimising associated administrative burdens on obligated parties:

- Awareness of ESOS was high with 90 percent of large undertakings reporting awareness of their obligations under ESOS six months prior to the December 2015 initial compliance deadline.
- Sufficient capacity (in the form of around 900 accredited lead assessors) to meet the demand for external energy audits stimulated by ESOS was also available in advance of the compliance deadline.
- This evaluation also suggested that the costs incurred by obligated parties were broadly in line with those expected in the Impact Assessment.

The ESOS compliance process was, however, characterised by a large degree of procrastination by obligated organisations with many delaying their decision to explore or pursue compliance options until close to the compliance deadline. This led to short-term increases in the demand for external energy auditors who were then able to increase their prices, and in some cases organisations delayed compliance until after the original compliance deadline. There was also a mistaken perception amongst some during the qualitative research that sanctions for non-compliance were unlikely. However, opting to go to the market close to the deadline is likely to have resulted in many organisations paying higher prices for the required energy audit services than may have been the case if demand had been smoothed over 2015.

While the scheme guidance did set out the qualification criteria, the evaluation evidence suggests that some UK parent companies did not include all relevant subsidiaries within the scope of their initial notification. This would then need to be followed up through the compliance process. This may indicate that processes may not have been fully understood by all obligated organisations, and in particular those with more complex structures. Similarly, obligated parties were required to report how many entities the notice covered,

though the administrator would have to contact organisations to see the entities that they included.

7.2 Provide Information on Energy Savings

This evaluation indicates that in the main, the information acquired by organisations through the ESOS process was thought to be a satisfactory standard. Over 70 percent of obligated parties were satisfied with the reports that they received and trusted the recommendations made. Initial checks undertaken by the Environment Agency indicated that the majority of ESOS audits were deemed to be compliant or compliant with remedial actions and indicate a positive level of compliance with the Regulations. However, a small number of participants were classed as non-compliant and were served with an Enforcement Notice requiring them to complete a series of actions to bring their ESOS assessment into compliance.

The evaluation research raised questions regarding how far obligated parties saw ESOS as purely a compliance exercise or as an opportunity to collect new (or validate existing) information on the array of potentially profitable energy efficiency investments. This was partly driven by the internal team assigned responsibility for managing the organisations' compliance (e.g. finance teams were more likely to see this as a box ticking exercise). The evaluation also suggests that cultural barriers regarding board level engagement in energy efficiency issues can be challenging to overcome (the qualitative research highlighted some cases of senior executive officers signing off ESOS reports without engaging in any significant way with the recommendations made).

7.3 Stimulate Take Up of Energy Efficiency Measures

ESOS was reported as an influence by a third of complier organisations (including those who intended to comply) making any given energy related improvement since early 2015, and by a fifth (22%) making fuel efficiency improvements. The mechanisms underlying this influence varied substantially: for example, gaining confirmation or external validation (e.g. as part of an energy audit) of previously recognised energy efficiency opportunities allowed some teams to compete more effectively for investment, while in other cases, ESOS prompted collection and analysis of energy information in sites or businesses that had not previously been examined (e.g. office sites in large manufacturing operations) – producing genuinely novel opportunities for cost-effective investment. Although the effects of ESOS on take-up of energy efficiency measures was not widespread, these were

broadly in line with the assumptions made in the Impact Assessment⁷². The early stage at which this evaluation collected evidence will also understate the likely future effects of ESOS.

7.4 Maximise Synergies with Existing Policies

A key uncertainty flagged in the Impact Assessment was the effect ESOS was expected to have on organisations also participating in a range of other energy efficiency policies. This evaluation has found that, in general, having previously undertaken energy data collection and reporting (for example, for the CRC Scheme) reduced the perception of burden from ESOS (although recordings of time and costs spent were no lower for these organisations who would generally have higher levels of energy use than those who did no previous reporting). However, in line with expectations, compliers with experience of other schemes were less likely to identify any increase in interest in energy efficiency within their organisation overall, or at board-level, to be as a result of ESOS.

⁷² Assumed to be at the lower end of the Directive's 0.4% and 5% energy demand reduction range estimate.

