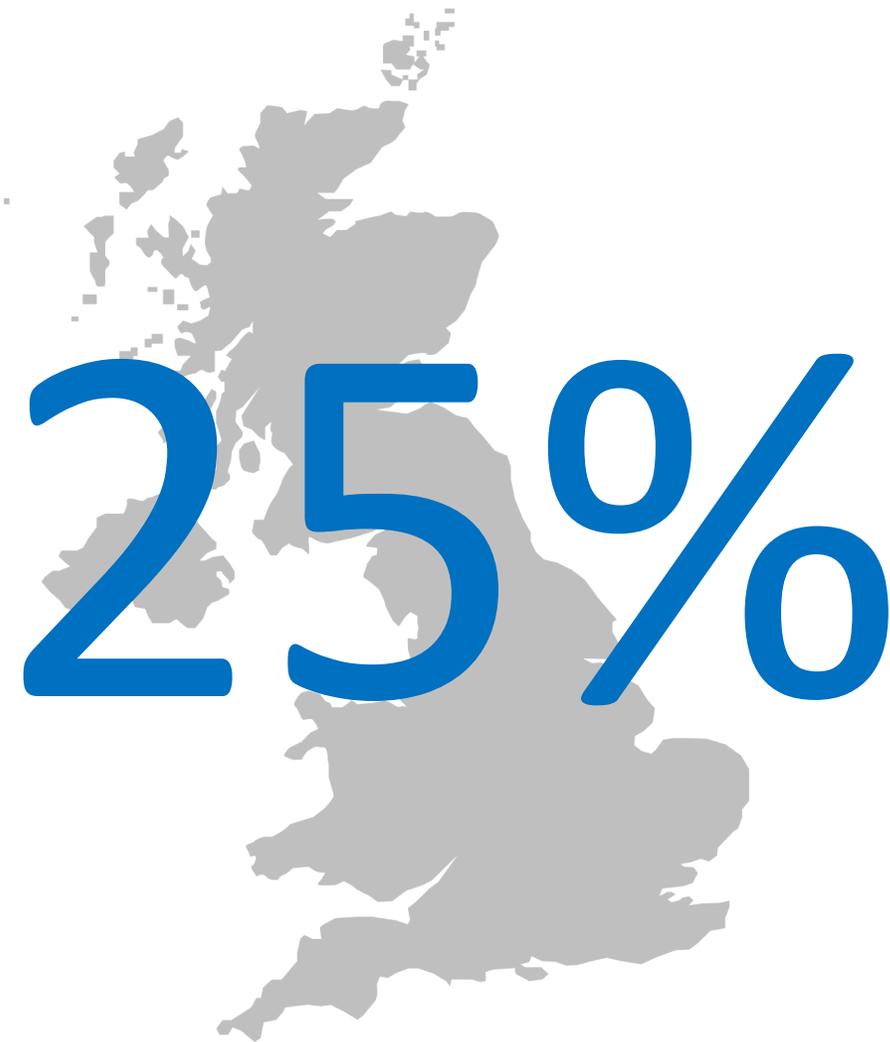


Energy Savings Opportunity Scheme (ESOS) Evaluation

Laura Edwards and Gary Shanahan, BEIS

We're going to talk about...

1. How ESOS was implemented in the UK
2. The evaluation work we commissioned
3. The findings from our final evaluation
4. What next for policies to expand business energy efficiency?



25%

What is ESOS?

- ESOS is an energy audit scheme which requires large businesses, at least once every 4 years, to have an assessor conduct an audit of energy use across the business and make recommendations for energy efficiency improvements
- Under Article 8 of Energy Efficiency Directive
- Introduced in 2014, with first compliance year ending in December 2015

What is ESOS?

- Audits of energy use in buildings, industrial processes and transport



- Policy objectives when ESOS was introduced in 2014:
 - Provide large undertakings with **information** specific to them 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 Directive, and
 - Maximise the **synergies** with existing policies.

ESOS: evaluation approach and methods

Two ESOS Evaluations

- 2015-2017 – Interim evaluation and feasibility study
 - Aim of this was to understand how effectively the ESOS scheme was being **implemented**, how businesses / assessors were responding; any unexpected **burden / costs**
 - Also to collect **baseline evidence** for a future longer-term impact evaluation
 - **Feasibility study** on how we might conduct an impact evaluation
- 2017-2019 – Impact evaluation / wider lessons on audits
 - Aim to understand **what the policy achieved** (i.e. what energy efficiency savings have resulted from the policy) and whether it met its **objectives**

Research questions

- **RQ1: Energy audits and reporting:** To what extent (in which ways and in which contexts) are energy audits and reporting effective in identifying and delivering energy efficiency savings across organisations?
- **RQ2: ESOS influence and impact:** To what extent (in which ways and in which contexts) has ESOS influenced organisational energy efficiency policy and practice? What impact has ESOS had on energy efficiency in organisations?
- **RQ3: ESOS lessons for future policy:** What are the lessons learned from implementing ESOS that could feed into future policies?

Evaluation challenges

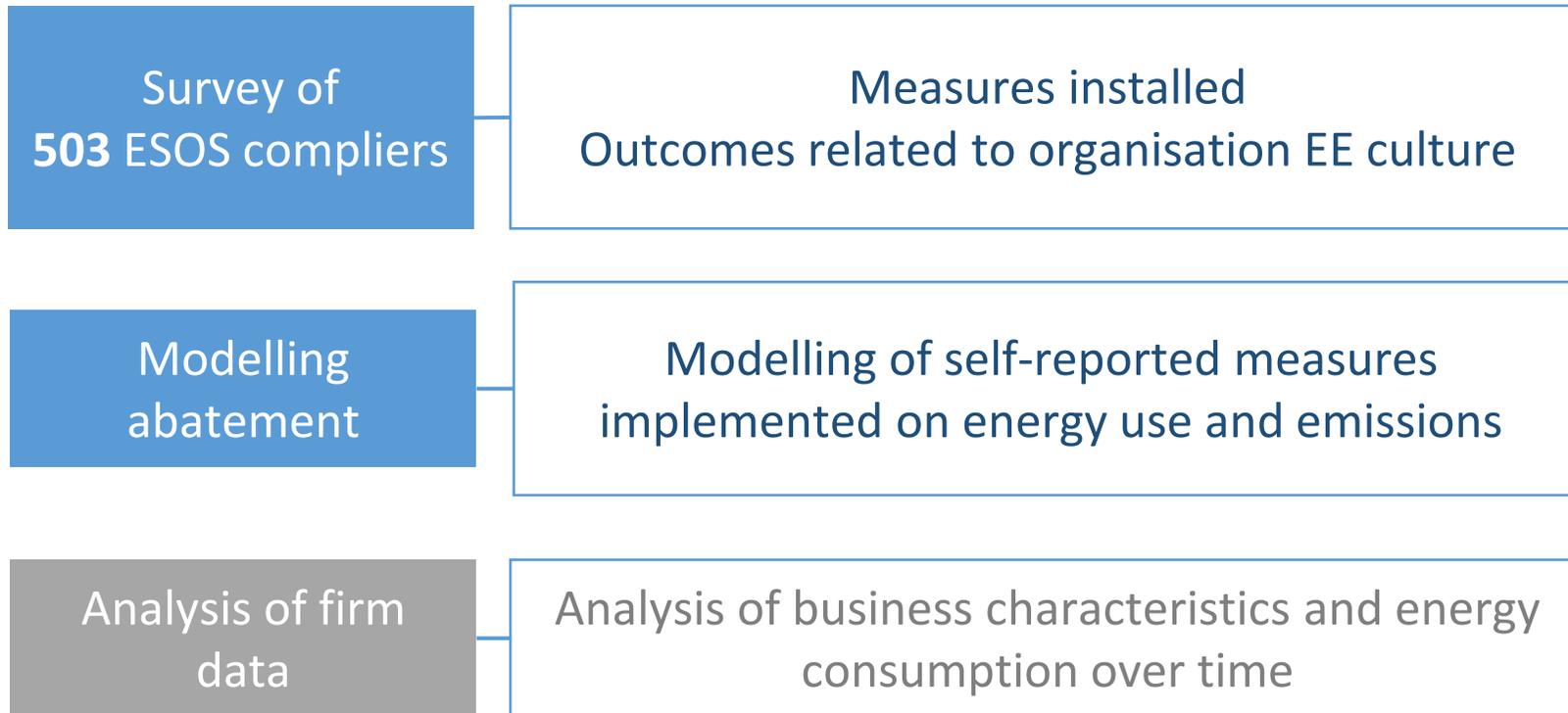
- Universality of ESOS – applies to all large businesses
- Complex and overlapping policy landscape
- ESOS participants were not required to submit the content of their ESOS energy assessments to the scheme administrator
- Challenges identifying impact below ultimate parent level (hidden impact on subsidiaries)

Key methodological elements in the impact evaluation

- Theory-based evaluation
- Principles of a realist approach – Context Mechanism Outcome framework
- Follow-up survey of ESOS compliers (Parent level)
- Energy and emissions savings modelling
- Qualitative research with organisations, assessors and supply chain organisations

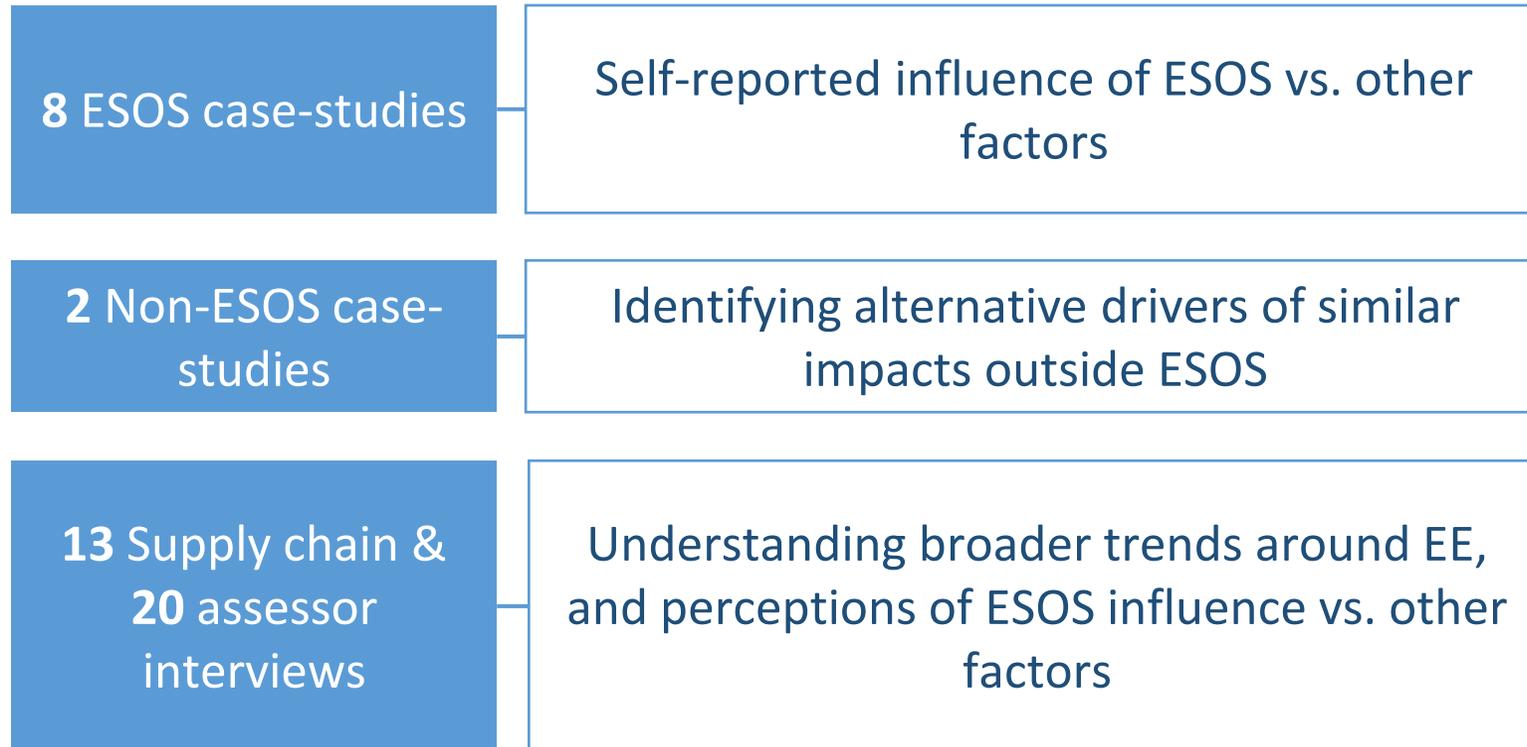
Evaluation methodology: data on impact

Stage 1: Gathering data on impact of ESOS

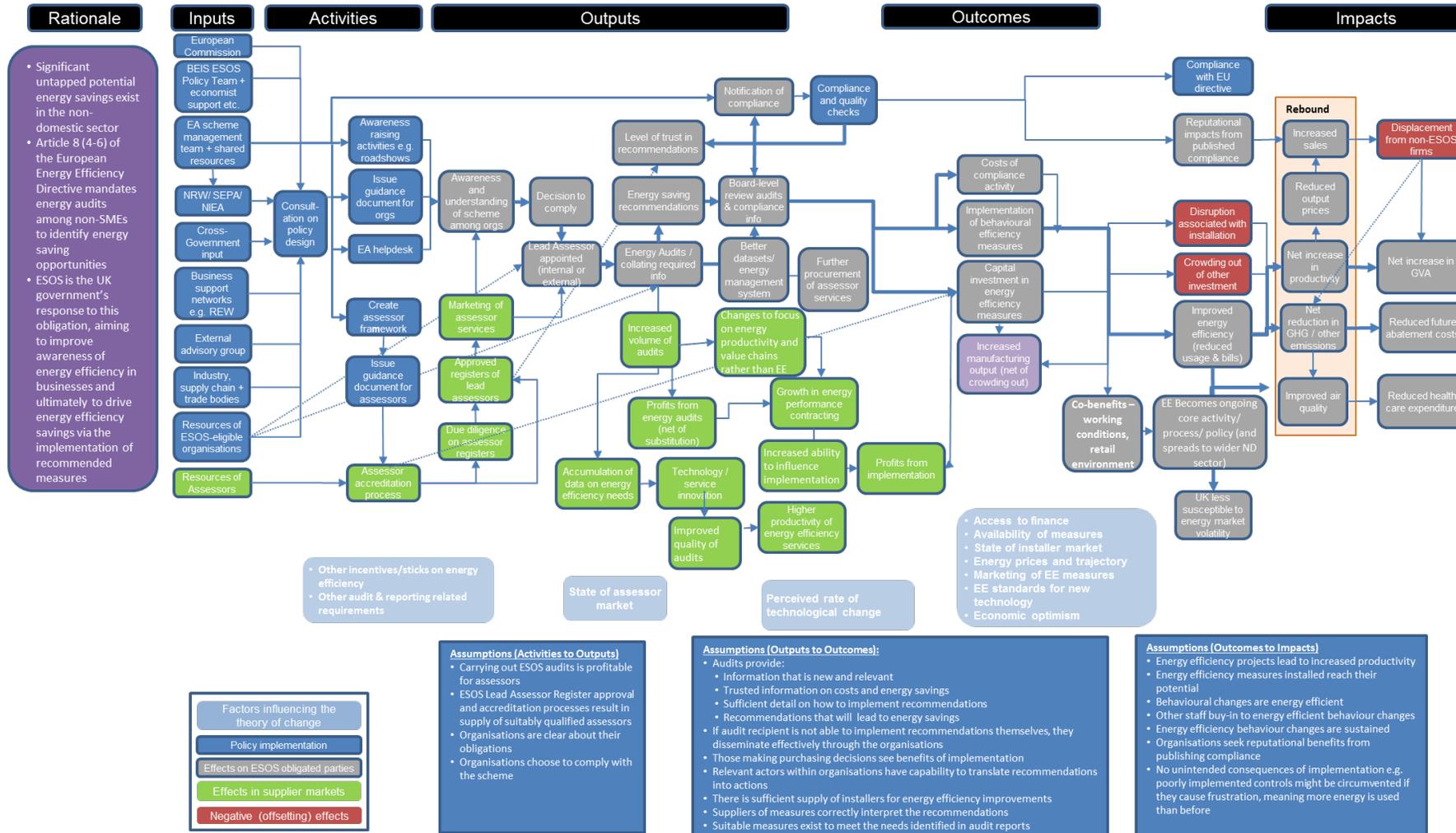


Evaluation methodology: attributing impact

Stage 2: Attributing impact to ESOS

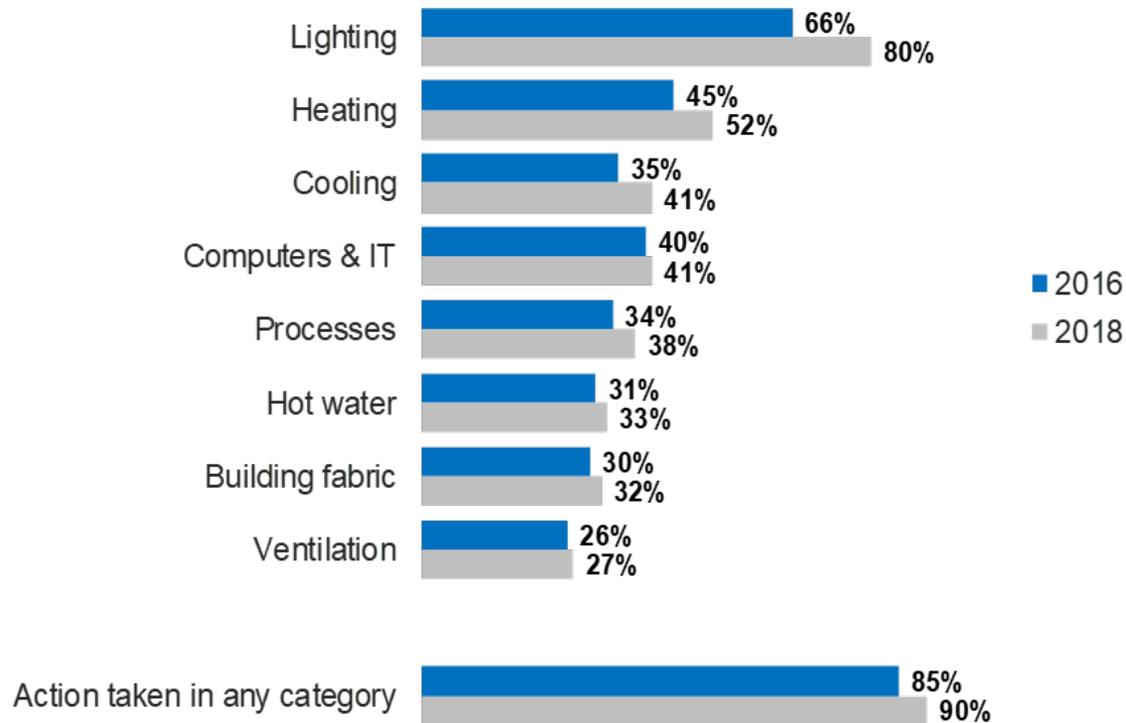


ESOS theory of change



Key findings on ESOS

ESOS one of the factors driving energy efficiency action



Measures implemented or planned since 2015

Organisations reporting implementing or planning measures **at least partly** as a result of ESOS:

1 measure 38%

2+ 29%

6% reported that at least one measure was implemented as a **direct result** of ESOS

Process-related measures (48%) & Lighting (46%) most commonly attributed to ESOS

Similarly ESOS contributed to transport measures

Fuel efficiency measures implemented or planned at least partly as a result of ESOS:

1 measure **32%**

2+ **20%**

4% reported that at least one measure was implemented as a **direct result** of ESOS.

Adjustments to journey or loading practices were most commonly influenced by ESOS (**38%**).

Proportion reporting their organisation's car fleet to comprise some low carbon vehicles

 **49%** (2016) to **54%** (2018)

“ *[One of our subsidiaries] created a new computer system to better capture their transport data. To be fair I think it was partly a Finance (team) push, but ESOS definitely helped them realise something was needed.* **”**

Modelling ESOS energy & fuel efficiency savings: broadly comparable to original estimates

Estimated savings as a result of measures implemented due to ESOS	Central Estimate	Lower Estimate	Upper Estimate
Industrial process changes	1.51TWh	0.38TWh	4.04TWh
Buildings changes	1.65TWh	0.47TWh	3.17TWh
Fuel efficiency changes	0.52TWh	0.36TWh	0.68TWh

<i>2014 ESOS Impact Assessment prediction</i>
<i>1.0TWh</i>
<i>1.3TWh</i>
<i>0.7TWh</i>

Net cost savings and savings opportunities attributed to ESOS

37% Agreed that changes made as a result of ESOS had led to net cost savings
(cf. 27% in 2016)

Highlighted new saving opportunities in some cases - improved awareness of energy efficiency opportunities

Provided external validation of known opportunities - encouraging implementation by strengthening the case for action

“ ESOS made us think about implementing higher efficiency lighting ahead of the curve of industry... we had already been moving to CFD but next stage of LED was due to ESOS ”

“ We weren't looking for an auditor to come in and provide us with energy issues. We pretty much had a full list of them. It was a validation of what we were doing ”

Other changes prompted by ESOS

- As a result of going through the ESOS process organisations introduced:
 - Energy efficiency related goals (17%)
 - Action plans (20%) and
 - Training (17%)

Plus

- Prompted certification with ISO 50001 (7%)
- A quarter reported that the **level of priority** placed on energy efficiency at board level had increased due to ESOS

Reputation or productivity benefits

- **16%** agreed that ESOS compliance **enhanced their reputation** with clients
- **8%** of organisations that had taken action due to ESOS **reported staff productivity increases**

Case study: Organisation whose ISO 50001 certification was expedited by ESOS believe it has helped them win work:

“Our clients have an expectation that we are certified”

Some organisations reported that ESOS had **improved indoor conditions for staff, customers or clients**

Improving awareness & discussion around energy

“ [ESOS had] *armed us with more information and knowledge*” and to have “*given us the opportunity to speak to subsidiaries, it was something to flag to them, it strengthened our dialogue as it was regulation*”

ESOS-Compliant organisation

“ *Organisations are getting better at looking at it, managing and bringing it [energy data] as part of normal reporting... some have better hold on their data* ”

ESOS Assessor

29% of organisations within a corporate group shared their full ESOS audit report or recommendations

Organisational contexts and external factors

More likely to implement measures where ESOS had initially prompted action (ISO 50001 certification or energy efficiency plans or goals)
But **less likely** to implement if **already energy mature**.

External drivers of organisational decisions:

- Financial drivers
- Natural equipment lifespan
- Competing priorities
- Relocation/ consolidation
- Broader Corporate Social Responsibility

ESOS and the assessor market

Short term

- Compliance generated significant work for assessors
- ~ 900 assessors accredited to ESOS scheme
- Many were **already engaged in energy or auditing services**
 - Some new entrants
 - Expansion into transport auditing
- Demand peaked in late 2015

Longer term

26% of organisations commissioned further follow-on work

Most common additional commissions

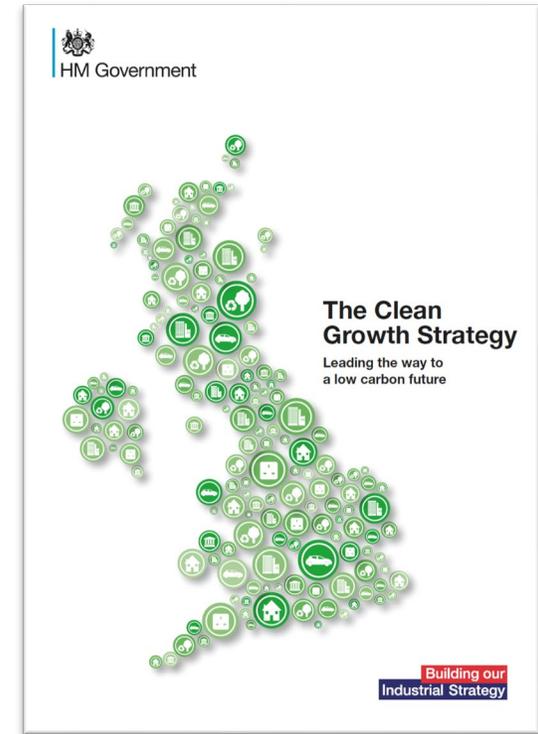
- Comprehensive or investment grade audits (9%) or
- Implementation of energy efficiency measures (7%).

“ *I'm not a sales person. I should have done more but didn't: after phase 1 everyone was so exhausted.* **”**

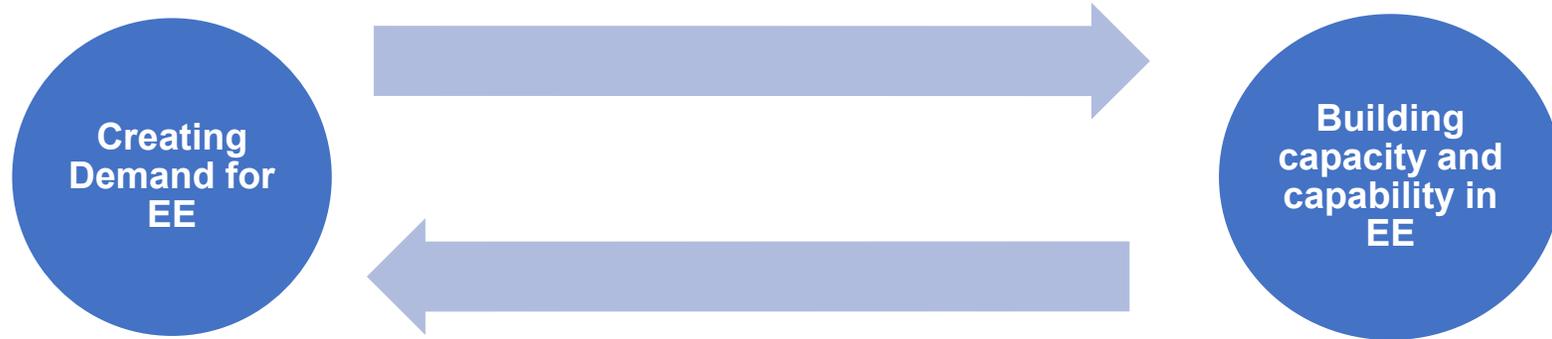
What next for policies to increase business energy efficiency?

Clean Growth Strategy – our ambition

- The Clean Growth Strategy set an ambition to improve business productivity by enabling businesses to improve energy efficiency by at least 20% by 2030.
- This means that energy use would need to fall by 20% and energy intensity by 45% in 2030 compared to 2015 levels.
- This will deliver:
 - Up to £6bn in cost savings for businesses
 - Carbon savings of up to 22 MtCO₂e
 - An important contribution to reaching net zero



What more needs to be done?



Businesses (particularly SMEs) don't typically think about EE (salience) or may not own buildings

Businesses don't have the expertise/time to look at what EE might be suitable for them

Culture of "tick box" compliance with non-core activities

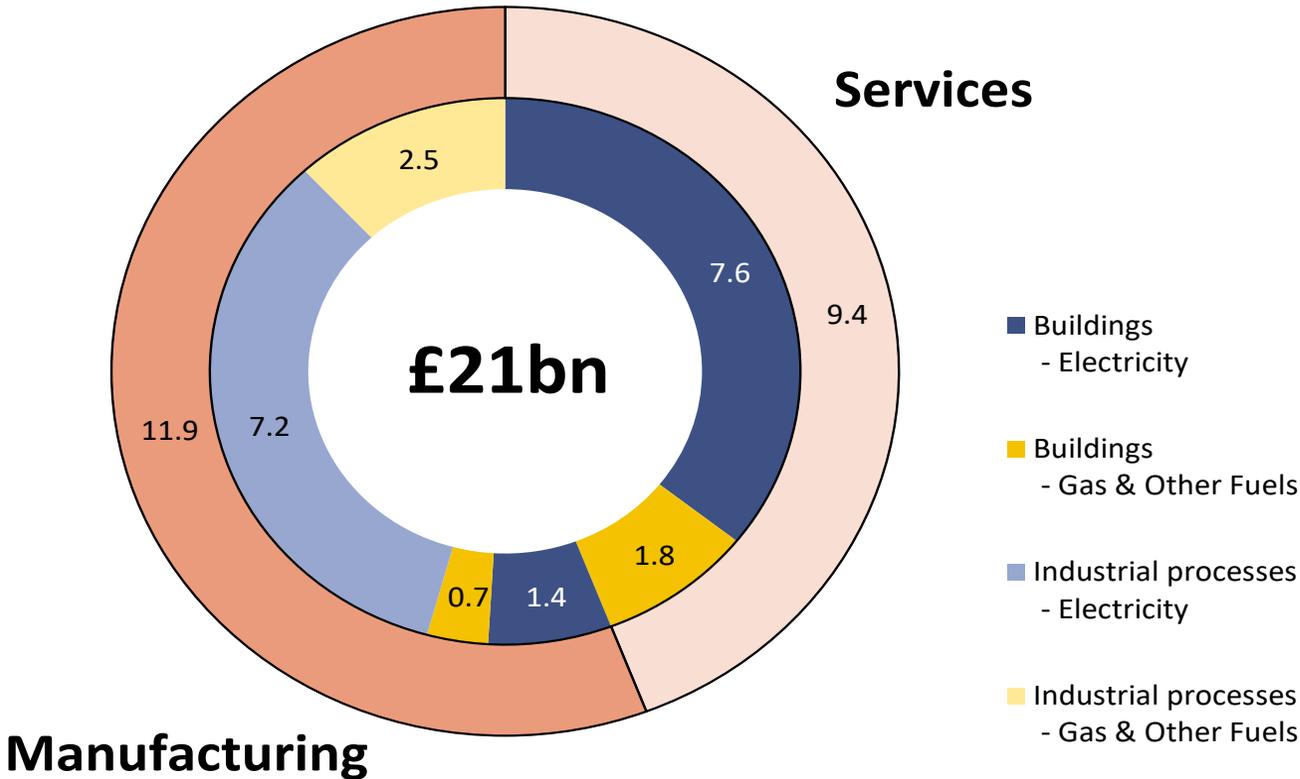
Perception that EE projects do not compare well against returns from other investment opportunities

Suppliers of EE technology/services don't think the demand is there so don't invest in building a business

Business models which could work are held back by lack of reliable & accessible data for investment decisions

Portfolios of EE projects carry financial & legal risks which are difficult to manage

Range of policy approaches to overcome barriers – non-domestic sector is not one size fits all



2015 final energy expenditure on energy by end use and fuel (£ billion, 2016 prices)

Department for
Business, Energy
& Industrial Strategy

Options for strengthening ESOS



Mandating implementation of ESOS recommendations



Extending the scope



Encouraging compliance via ISO 50001



Public disclosure

Enforcement and design challenges



GAMING



SAFEGUARDING
BUSINESS



BEHAVIOUR
CHANGE



MAINTENANCE

Thank you

Links:

- Energy audits and reporting (Final report): <https://www.gov.uk/government/publications/energy-audits-and-reporting-research-including-the-energy-savings-opportunity-scheme>
- Interim report: <https://www.gov.uk/government/publications/energy-savings-opportunity-scheme-esos-evaluation-of-the-scheme>

Email:

Laura.Edwards@beis.gov.uk

Gary.Shanahan@beis.gov.uk