Evaluating support for local authorities to deliver sustainable communities

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ABSTRACT

The Energy Saving Trust is an independent non-profit organisation which aims to cut CO_2 emissions by promoting the efficient and sustainable use of energy within the UK domestic sector.

Local authorities (LAs)[1] are a key actor within the UK. They play a central role in the refurbishment and new build of housing stock. The Energy Saving Trust supports LAs by providing advice and guidance on how to reduce CO_2 emissions through:

- Installing energy efficiency and renewable measures in the LAs' own social housing stock
- Encouraging and assisting the local community living in private housing to reduce their energy consumption

The purpose of the evaluation is:

1. To estimate the CO_2 emission savings delivered by LAs through action in both property owned by the authorities and community owned housing
2. To understand whether and how the Energy Saving Trust has influenced the LAs' to reduce CO_2 emissions and the value provided
3. To understand drivers and obstacles the local authorities face when taking action on sustainable energy.

This paper focuses on the methodology for data collection and analysis, which has been developed to understand the CO_2 savings achieved by LAs and establish which of those savings can be attributed to the help from the Energy Saving Trust's work. The results presented are from the most recent evalation conducted in 2008. The paper shows how evaluation results have been used to develop and improve the services, thus further reduce CO_2 emissions. Limitations of the methodology and ways to minimise their effect are discussed.

Introduction

The Energy Saving Trust is one of the UK's leading organisations set up to address the damaging effects of climate change. They aim to cut carbon dioxide emissions – the main greenhouse gas causing climate change – by promoting the sustainable and efficient use of energy. It is an independent, non-profit making organisation and acts as a bridge from government to consumers, trade, businesses, local authorities and the energy market. The Energy Saving Trust provides impartial information and advice to these respective audiences from offices located in London, Scotland, Wales and Northern Ireland. It also has a network of advice centres across the UK specifically designed to provide local knowledge to help consumers and other actors, such as LAs, to take action to save energy in their local area.

The Energy Saving Trust is a key facilitator of the Carbon Emissions Reductions Target (CERT) mechanism. CERT (2008 – 2011) is the third three-year phase of a domestic energy supplier obligation in Great Britain and obligates all domestic energy suppliers with a customer base in excess of 50,000 customers to take steps to ensure that the amount of CO_2 emissions from homes is reduced. In reality, CERT means that grants and offers are provided to encourage the uptake of energy efficiency measures and renewable energy technologies in homes; saving CO_2 and money on fuel bills. The Energy Saving Trust helps consumers and local authorities access funding through CERT and take action on climate

[1] The service proactively focusing on helping local authorities, but services are also available for housing associations ('HAs'). Local authorities or 'LAs' will be used as they are the primary focus of advice.

change by providing advice and support on the right measures and the best way to install those measures for maximum benefit.

Scope of the Local authority service offering

Local authorities (LAs) are a key audience for the Energy Saving Trust as they play a central role in taking action on climate change in the UK. This is in terms of being responsible for improving the energy efficiency of social housing stock, influencing their householders in the local community to improve their own private housing, building low carbon new homes and influencing change in the planning system to enable approval for energy efficiency and microgenation installations in homes.

The National Indicator NI 186 - Per capita reduction in CO_2 emissions in the Local Authority area - is one of the 188 national indicators set by the Government designed to measure progress against agreed national priority outcomes in local area agreements (LAA).

The objective of the Energy Saving Trust's work with LAs is to drive the installation of significant energy efficiency and renewable measures into existing homes, through refurbishment, and the building of low carbon homes. The Energy Saving Trust offers a wide range of advice and support to help LAs deliver on their commitments.

They can be crudely split by service delivery into two cateogries:

- The centrally run advice service; '*Practical help*'. The service offers a one stop shop providing a range of advice, support and services designed specifically to help LAs develop and implement sustainable energy initiatives to mitigate climate change. This service provides a helpline, online tools and resources and additionally some consultancy research time for advice and support on more complex issues the LA needs help with.
- The in-depth '*local outreach*' support service offered to a selection of LAs that have requested help. The service aims to help LAs reduce area-wide carbon emissions in a strategic, co-ordinated and sustainable way and demonstrate local leadership in addressing climate change. The advice and support is bespoke and tailored specifically for the LA with local advisors providing the support. A strategic CO_2 reduction action plan is developed with the authority which they take forward and implement.

The main focus of the Energy Saving Trust's advice and support is over the following areas:

- Tactical help; helping the LA Officer responsible for energy efficiency in housing to improve the energy efficiency of the housing stock
- Policy and Strategic Advice; developing and implementing a sustainable energy strategy
- Funding; signposting sources of funding for sustainable energy
- Community Leadership; achieving the right culture in and reaching out to communities
- Energy Services; activities to reduce energy consumption including energy efficiency measures, advice, grants and loans
- Planning and Building Regulations; advice for planners to assist them in using the planning system to reduce carbon emissions as well as guidance on meeting and going further than building regulations

Scope of the Evaluation of the local authority service

Evaluation of the Energy Saving Trust's work with local authorities is to:

1. Determine the effectiveness and impact - in CO_2 emission savings - of its advice and support through the number of energy efficiency and renewable measures that have been installed[2] as a result of the advice and support provided by the Energy Saving Trust.
2. Understand how that impact has been achieved and why. This includes understanding the 'added value' the Energy Saving Trust provides, strengths and weaknesses of the services,

[2] The number of low carbon homes being built is also explored, but not focused on in this paper

the drivers, barriers and areas of improvement.

The evaluation is managed by the internal Energy Saving Trust Evaluation Team, a separate team within the Energy Saving Trust located within the Strategy Deparment, independent of the delivery and marketing arms of the organisation. The Evaluation Team's role is to objectively assess the effectiveness, value and impact of the Energy Saving Turst's 'sustainable energy advice' activities. Where possible, and where resources are available, all Energy Saving Trust activities are evaluated on a regular basis.

For a number of years the Energy Saving Trust has worked with the research consultancy, Databuild, an independent research consultancy, to carry out regular evaluations of the services provided to local authorities. Databuild leads on conducting the fieldwork research and analysis. This ensures the survey respects respondents' confidentiality and is completely impartial. The collaboration between the Energy Saving Trust's Evaluation Team and Databuild on the evaluation of the Energy Saving Trust's local authoirities services commenced in 2004. The methodology for the evaluation of the LA service has remained broadly consistent since then.

The evaluation results are used by a variety of different audiences, mainly:

- Operationally, to inform future improvement of the delivery and marketing of the services
- Strategically, to to inform where resources and activity should be focused in the future in the organisation
- To Government funders - UK Department of Energy and Climate Change (DECC), Scottish Government (SG) and the Welsh Assembly Government (WAG) – to report on impact, value for money and provide acountability of funds.

Evaluation Methodology

Approach

The evaluation methodology has remained broadly consistent since 2004, though refinements have been made. It has involved:

- A quantitative survey of 131 (32%) local authorities. The key representative responsible for energy efficiency in housing, generally the Energy Officers or Sustainability Officer, is interviewed.
- A qualitative survey of local authority Chief Executives, Councillors, Senior Managers and Planning Officers are interviewed, those with decision-making powers within the LA.

The quantitative survey enables questions to be asked about the activity that the LAs have taken to install energy efficiency measures into existing homes[3]. This enables robust data on energy efficiency or renewable measures that have been installed to be collected and CO_2 emission savings as a result of those measures to be estimated.

The fieldwork for the annual evaluation of the LA service offering takes place at the end of the financial year. This is in order to leave as much time as possible for the LAs to take action following the advice provided earlier on in that year.

The qualitative survey enables key topic areas of interest for the year or arising from the quantitative survey to be explored in further depth through qualitative interviews. These interviews allow the understanding of how and why impact has been delivered and which elements of the support have been specifically influential to the LAs. Drivers and barriers to take action, strengths, weaknesses and areas for future improvements are key areas of focus.

The quantitative sample has been constructed to ensure a robust and representative sample is obtained and to ensure that all types of authority (district, unitary, borough) are covered and include LAs

[3] The building of new low carbon homes is also asked about but will not be the focus of this paper

from the four devolved nation countries within the UK. The structure of the sample for the 2009 evaluation is shown in Table 1 below.

Table 1: Local Authority Sample

Type	Universe	Sample: No. of local authorities interviewed
English District	238	59
English Metropolitan	36	16
London Borough	33	12
English Unitary	46	22
Scottish Unitary	32	9
Welsh Unitary	22	12
Northern Ireland	1	1
Total	**408**	**131**

85 qualitative interviews were undertaken with senior managers, elected members and energy officers. These respondents were selected following the quantitative study to enable the results of the quantitative survey to be validated and allow the exploration of a range of topic areas:

- Patterns of behaviour
- Uses of the service
- Motivations and obstacles
- Funding; signposting sources of funding for sustainable energy
- Activity levels on energy efficiency and renewable measures installed

The data from the quantitative survey were weighted to arrive at estimates of impact for the UK as a whole; this was done separately for each type of authority listed in figure 1. A weight was applied to each response. This was calculated as:

$$\frac{\text{Number of authorities of that type in the UK}}{\text{Number of authorities of that type in the sample}}$$

Attribution of action

There are a wide range of pressures and influences which may encourage local authorities[4] in the UK to implement measures to reduce energy consumption in homes in their area; the Energy Saving Trust is just one of these.

Consequently, it is important to establish not only the activity on energy efficiency and renewables the local authority has taken, but also what level of activity the Energy Saving Trust has influenced. It is also important to establish how the Energy Saving Trust has influenced authorities and how important that influence was.

This has been done through a three stage questioning process.

1. Local authorities are asked if they have made any energy efficiency improvements or renewable installations to the housing in their area. This includes the different types of housing tenure, own social housing, private rented and private owner occupied. Detailed information is collected about the measure[5] type and the number of houses in which these measures have been installed.

2. Local authorities that have made improvements are asked a series of questions – known as *attribution question areas* - about the help they have received from the Energy Saving Trust.

[4] As noted in the Introduction the service also helps housing associations take action on climate change, therefore, the same approach is taken to calculate the impact the Energy Saving Trust has influenced through housing associations.

[5] Projects of measures may also be reported

Respondents are asked about the influence the Energy Saving Trust played for each type of measure that has been installed.

Where the Energy Saving Trust has been helpful and influenced the installation of measures, these measures are attributed to the Energy Saving Trust as impact. This approach also enables an understanding of which elements of the advice and support has helped them in relation to the specific measures that have been installed.

The five *attribution areas* align with the Energy Saving Trust Local Authority Programme logic and what it is trying to achieve through the services it delivers. These are:

- Deciding which measures to install
- Developing standards for the work
- Influencing others to approve the measure/project
- Communicating the benefits of the change to occupants
- Obtaining funding

3. Responses are classified by 'strength' of influence on a scale. Local authorities are asked to classify the extent of the influence of the Energy Saving Trust's advice was in helping them with the 'key attribution areas', from deciding what measures to install along the process to seeking funding to help install the measures.

This way the Energy Saving Trust can understand the strength of its influence and in which areas. Where the Energy Saving Trust is reported as no influence to measures then the measures are *not attributed*. The combined *attributed* and *not attributed* measures would indicate all activity undertaken by the LAs in that year, referred to as all LA 'market activity'.

A similar approach has been used on all the Energy Saving Trust's evaluation work which provides consistency and allows comparisons to be made across evaluations of other programmes and activities.

Estimating CO_2 emissions savings

The survey establishes the number of homes that have been affected and the number of measures that have been installed[6], both with the influence and without the influence of the Energy Saving Trust. The key measures of which activity levels are asked about in survey include:

- Installation of new boilers and heating systems
- Insulation of lofts, cavity and solid wall insulation
- Installation of energy efficient glazing and lighting
- Installation of small scale renewable and energy measures such as photovoltaics, and ground source heat pumps.

Associated annual and lifetime CO_2 emission saving factors[7] – associated to each energy efficiency and renewable measure - are then applied to estimate annual and lifetime CO_2 emission savings.

Each measure has an associated estimated average annual CO_2 emission saving and a lifetime value in years. The lifetime figure is the estimated number of years that the measure is expected to continue to save the annual CO_2 saving. The lifetime CO_2 emission saving figure is achieved by multiplying the two metrics together.

Annual tCO_2 X *lifetime in years = Lifetime tCO_2*

[6] The approach described here is for the refurbishment of existing homes, the same approach is applied to where the building of new low carbon homes has been influenced

[7] Net savings are applied for insulation, as opposed to Gross savings, where net takes account of the comfort factor or direct rebound effect

The saving factors applied are derived from official published Department of Energy and Climate Change (DECC) - Carbon Emissions Reductions Target (CERT) [8] saving factors.

The evaluation methodology takes devolved nations into consideration and surveys representative samples from all devolved nations in the UK - England, Wales, Scotland and NI. Therefore, saving factors are calculated for each devolved nation using saving factors weighted by property type and fuel mix.

CO_2 savings are the current priority and key indicator on which the Energy Saving Trust is required to report on to demonstrate impact. Additional key quantifiable benefits are also calculated such as energy savings, financial savings and cost effectiveness. The Energy Saving Trust determines the cost effectiveness of their services by calculating the cost per tonne of CO_2 (£/CO_2).

Qualitative results are viewed with equal importance to quantitative results and significant qualitative research and analysis is undertaken to help the Energy Saving Trust understand their 'added value'. Key areas reported as strengths and weaknesses of the services and areas for improvements. This is, however, not the focus of this paper.

Results

Evaluation results presented are from the most recent full evaluation of the Energy Saving Trust's services offered to LAs in 2009[9]. The survey explored the measures taken by local authorities in the three types of housing tenure in line with how advice and support is targeted and delivered to the LAs:

- Social housing; housing owned by the authority and rented out to social tenants
- Private rented housing; housing owned by private sector landlords and rented out to private tenants
- Owner occupied private housing

For each type of housing the survey captured the number of measures implemented or supported by the authority, see Table 2 below.

Table 2: Number of measures installed in local authorities

	No. of Measures by types of housing tenure[10]			
Measure type	**Social housing**	**Private rented housing**	**Owner occupied private housing**	**Total**
Boilers	52,000	1,510	8,195	61,705
Heating controls	23,450	150	1,150	24,750
Cavity wall insulation	51,210	29,555	52,600	133,365
Loft insulation	69,620	31,010	56,240	156,870
Solid wall insulation	1,220	0	20	1,240
Energy efficient lighting	32,385	35,345	25,160	92,890
Energy efficient glazing	38,330	80	2,170	40,580
Renewable energy measures	0	350	790	1,140
Total measures	268,220	98,000	146,320	512,540

[8] http://www.decc.gov.uk/en/content/cms/consultations/open/cert/cert.aspx

[9] This followed activity funded in the financial year 2008-9, 1st April 2009-31st March 2009.

[10] Measures numbers are rounded

Local authorities' social housing

Table 3 below shows the CO_2 savings achieved by authorities, analysed by the extent to which the Energy Saving Trust influenced those savings. 62% of LAs felt that the Energy Saving Trust had influenced the installation of measures they had implemented in their social housing; however, those respondents only implemented 45% of all measures resulting in 40% of annual savings.

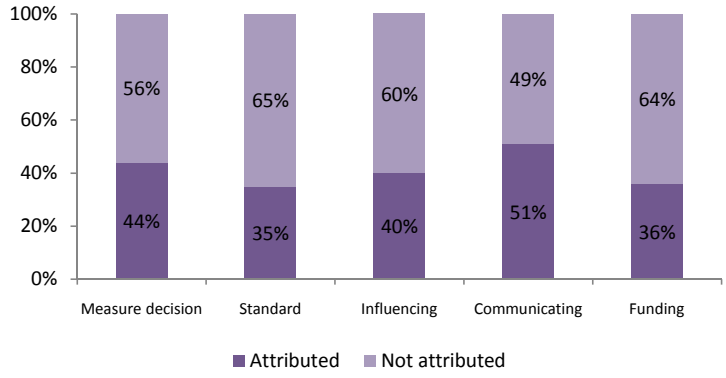
Table 3: Measures implemented and CO_2 savings in social housing (n=52)

Social Housing	Attributed	Not attributed	Total 'market activity'	% Attributed
Number of measures	121	148	268	45%
Annual savings 000tCO_2	43	65	108	40%
Lifetime savings 000tCO_2	1,240	1,527	2,767	45%

Figure 1 below shows the analysis by each of the aforementioned *attributed areas*; illustrating in which areas the Energy Saving Trust had been influential. Many respondents reported that they had exhausted the potential to implement what they thought of as easier measures (heating, lighting, cavity wall and loft insulation) and were left with harder to treat properties such as those with solid walls or those without mains gas.

While a significant proportion of respondents had installed solid wall insulation and renewable energy measures; in most cases only a small number of homes had been improved and measures had been implemented on an experimental or trial basis. There was greater implementation of renewable measures in Scotland**.**

Figure 1: How the Energy Saving Trust helped with social housing measures (n=41)



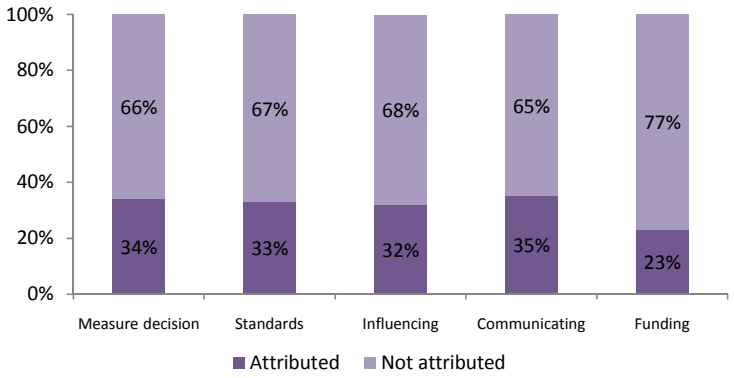
Private rented housing

54% of LAs reported that the Energy Saving Trust influenced the installation of measures; they accounted for 42% of measures. However, those measures accounted for 57% of annual CO_2 savings. Table 4 below shows the CO_2 savings achieved by LAs, analysed by the extent to which the Energy Saving Trust had influenced the installation of measures. Figure 2 illustrates the areas in which the Energy Saving Trust's advice had been influential.

Table 4: Measures implemented and CO_2 savings in private rented housing (n=67)

Private Rented Housing	Attributed	Not attributed	Total 'market activity'	% Attributed
Number of measures	41	56	98	42%
Annual savings 000tCO_2	19	14	33	57%
Lifetime savings 000tCO_2	723	562	1,285	56%

Figure 2: How the Energy Saving Trust helped with private rented housing measures (n=44)



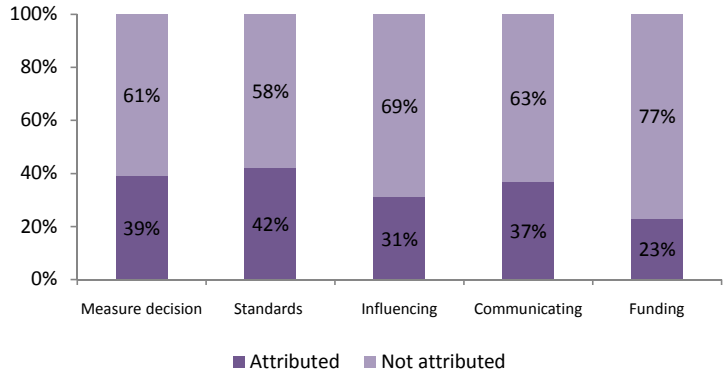
Owner occupied private housing

Table 5 below shows that 53% of authorities reported that the Energy Saving Trust was influential; however, this accounted for 78% of measures and 72% of annual savings. This suggests that the Energy Saving Trust is helping authorities to implement more measures. Figure 3 below shows the responses analysed by attribution question area.

Table 5: Measures implemented and CO_2 savings in owner occupied private housing (n=77)

Owner Occupied Housing	Attributed	Not attributed	Total 'market activity'	% Attributed
Number of measures	113	32	146	78%
Annual savings 000tCO_2	46	18	64	72%
Lifetime savings 000tCO_2	1,640	686	2,327	71%

Figure 3: How the Energy Saving Trust helped with owner occupied private housing measures **(n=55)**



Conclusions

The conclusions for the evaluation results for 2009 are presented below alongside how they have been used to inform service improvements. Limitations of the methodology and ways to minimise their effect are discussed.

Conclusions of 2009 results

Action taken by local authorities in 2009 is estimated to have achieved 6,379,000 tCO_2 lifetime savings. The Energy Saving Trust has influenced 3,600,000tCO_2 lifetime savings. Table 6 below shows the breakdown of the CO_2 lifetime savings.

Table 6: Lifetime savings achieved (000tCO_2)

Housing type	**Total savings 'market activity'** (000tCO_2)	**Savings attributed to Energy Saving Trust** (000tCO2)	**% Attributed**
Social housing	2,768	1,239	45%
Private rented	1,283	722	56%
Owner occupied private	2,328	1,639	71%

Overall, 47% of savings achieved by LAs was attributed to the work of the Energy Saving Trust. The proportion of savings that was attributed was higher for measures taken in private rented and owner occupied housing.

Measures and related savings in LAs' own social housing are falling as authorities complete the simpler measures and are left with more of the difficult and harder to treat homes (such as solid wall homes). Measures and related savings in the private sector are increasing.

Many authorities have taken some action on hard to treat homes and renewable energy; however,

the steps LAs have taken are small scale and often experimental and there is little evidence of such measures entering the mainstream.

Uses of findings

The Energy Saving Trust views its sustainable energy knowledge base as the cornerstone of its work; the evaluation findings are an integral part of that knowledge base. There are two key ways in which evaluation results are fed into that knowledge base and utilised internally to inform future decisions - that is tactically and strategically.

At a tactical level, lessons learned are shared with the Programme Team with the aim of improving the delivery and marketing of services to LAs. Evaluation results are shared with the Programme team as soon as possible in order to feed into operational activity in real time. From the start of the evaluation and throughout the process we work closely with the Programme Team to ensure that the evaluation outputs will be beneficial and provide valuable insight and the necessary information in order to improve services for LAs. Strategically, evaluation findings are fed in more formally through the annual planning process for evidence based decision making about the future of LA services and overall Energy Saving Trust activity.

Examples where findings have steered the support the Energy Saving Trust delivered to LAs include:

Strategic

- Evaluations over time have shown the LAs have begun to equip themselves with more knowledgeable and experienced staff, as climate change rises up the Government's agenda. The Energy Saving Trust has responded to this by increasing the quality of their service by providing more in-depth and bespoke support. The local outreach 'One-to-One' service was developed for English LAs to provide in-depth tailored support over two years to help the authority develop a bespoke strategic action plan on climate change.

Operational

- Development of TRACE – a monitoring tool available through the Energy Saving Trust services online to help LAs track the progress they are making on reducing CO_2 emissions. This tool was developed in response to LAs reporting back to us that they needed help with monitoring and reporting against the new Government National Indicator NI 186. NI 186 is the indicator against which CO_2 savings per capita in the local authorities' community are to be reported.

Methodology limitations

The methodology developed in 2004 was progressive in its aim to undertake a large, representative sample of LAs across the UK - with devolved nation splits - to inform the Energy Saving Trust and Government about the level of energy efficiency and renewable activity.

The methodology has been very successful in providing robust, representative and most importantly trusted results internally and externally for our Government Funders. The methodology for the evaluation of the Energy Saving Trust LAs services has remained largely consistent over the years and only limited refinements have been made. This has enabled comparison of results over the years.

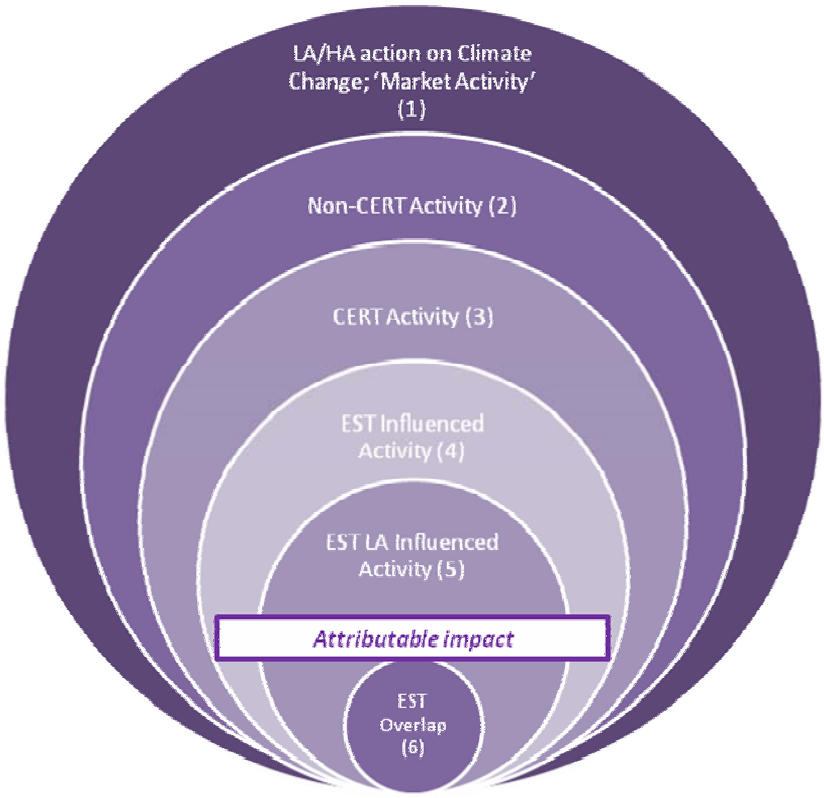
There are, however, limitations to the methodology. The Energy Saving Trust and Databulid have attempted to minimise the impact of these limitations on results over the years; this is discussed below.

Influence of the Energy Saving Trust, attributing CO_2 savings

Firstly, Figure 4 shows a crude representation of the main influences on energy efficiency action in the 2009 policy landscape context, in which the Energy Saving Trust works within. In the policy landscape at this current stage it is acknowledged that CERT drives most energy efficiency activity in

the marketplace and thus CERT figures on energy efficiency installations (reported by Energy suppliers to Ofgem the Energy Regulator) would make up the majority of the market activity. The Energy Saving Trust is a key facilitator of CERT, but recognises it is not the only player in the market.

Figure 4: Sphere of influence illustrating the activity undertaken by LAs on climate change and the influence attributable to that of the Energy Saving Trust's services.



(1): All action undertaken by LAs on climate change (energy efficiency and renewable activity) is referred to as 'market activity'
(2): Activity not driven by the main Government policy driver CERT
(3): Activity driven by the main Government policy driver CERT
(4): EST is a key facilitator of CERT. EST also has influence outside of CERT.
(5): EST services underpin each other and overlap in their aim to drive activity into the same areas

Verification of data

In 2004 when this methodology was developed the Energy Saving Trust were one of the few organisations providing energy efficiency advice to the domestic sector and now are one of many. Six years ago the attribution of impact was far less complex and a direct line of sight was easy to draw from the Energy Saving Trust advice to the tangible energy efficiency measures taken on the ground. Today, in this noisy environment with many actors having an influence, it is incredibly difficult to isolate the Energy Saving Trust's own worth and attribute impact.

To ensure that variation in results or change in results are naturally occurring and not as a result of distorted sampling or data collection and analysis a variety of verification checks are undertaken to provide confidence in our results and limit this possible risk of error. Verification checks cover a variety of potential areas of error including; biased and unrepresentative samples, errors in grossing results up, over-claim and overlap and double counting of installations of measures.

The potential for over-claim is reasonably high. Taking action on climate change is a requirement by Government and LAs obviously want to be seen taking the responsibility seriously. This can be reflected in our surveys as an over-claim of activity; there is potential for higher levels of activity to be

reported than actually undertaken.

In many cases the Energy Saving Trust's activities are meant to underpin each other in the activity they deliver, however, when reporting impact we need to be aware of where those potential overlaps may lie and be cautious not to double count impact.

Internal insight is also fundamental within our verification checking process. Results are checked to ensure they are in-line with monitoring information, collected by the Programme Team throughout the year, tracking the progress of the service. Results are discussed early on with the Programme Team - who work at the coalface of activity - to ensure they feel that the results are indicative of what they have been seeing on the ground. If there are any concerns further checks are undertaken to address their concerns and provide confidence in the data.

From the start of the evaluation when structuring the sampling framework every effort is taken to ensure that the sample is robust and representative. Then overall results are benchmarked against data available in the market place. Reports such as the industry sales figures and market data, official Ogfem CERT figures and national statistics data such as the English House Condition Survey. Remedial actions are taken to address concerns on a case by case basis where the above issues have affected results.

Should CO_2 savings be attributed?

In this world where public services are required to provide evidence to show their worth, in the business of 'climate change', attributed impact in CO_2 emission savings are the desired and ultimate metric. We have developed a methodology that we feel is robust, representative and informative to respond to this demand. We provide the Energy Saving Trust's impact in attributed CO_2 savings using the most cost effective approach available at the current time.

Our CO_2 savings methodology is based on social research principles; it involves value judgments for which there lies risk and limitations. We believe we answer to this demand for 'attributed impact' while also limiting risk.

We also ensure that results are presented in context. The attributed CO_2 emission savings impact results are one source of evidence from the evaluation – a valuable piece – but one source and should be used in conjunction with other sources of evidence such as qualitative results. This is to ensure that informed decisions are made on the basis of all data available and not solely attributed CO_2 savings.

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