



# Resource Efficient Scotland Advice and Support Hub: 2016-17 Impact Evaluation

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# 1 Executive Summary

Resource Efficient Scotland (RES) is a Scottish Government-funded programme delivered by Zero Waste Scotland, which helps Scottish-based organisations to reduce costs and carbon emissions by implementing resource efficiency measures, covering energy, water, raw materials and waste. This report summarises the findings from an impact evaluation of RES support delivered in 2016-17. The evaluation was commissioned by Zero Waste Scotland's evaluation team and undertaken between August and December 2017 by a third-party contractor (Databuild Ltd). This summary report has been written by Zero Waste Scotland's evaluation team using Databuild's findings.

The impact evaluation focused on quantifying the impacts of "in-depth" and "light-touch" support delivered by the RES-Hub between April 2016 and end of March 2017. During the same period, the RES programme has provided a wider range of support that was outside the scope of this impact evaluation (either because impacts will be more qualitative in nature, or quantified impacts will only be measurable over a longer time-frame than the current work).

The impact evaluation methodology consisted of two types of telephone interview and analysis with a sample of organisations. During interview beneficiaries were asked about any actions taken since using RES support, the impact on their organisation and the degree to which they felt RES support had influenced the outcome. The report provides an overview of the methodology and further details are available on request.

For in-depth support, 78% of beneficiaries had taken action or had definite plans to take action at the time of the evaluation and 51% of recommendations made by RES advisors were implemented/had credible plans to be implemented. In total, 41% of quantified cost savings and 32% of quantified carbon savings were implemented/likely to be implemented. A large majority (82%) of organisations that had implemented recommendations following in-depth support credited RES with improving the outcome to some extent, and 52% state the changes were unlikely to have happened in the absence of RES advice and support.

For light-touch support, 57% of the organisations that had used light-touch support had taken or were planning to take action. Of those organisations taking action, 75% said that RES support had improved the outcome to some extent, whereas 25% thought that action would still have been taken in the absence of RES support.

The quantified impacts of in-depth and light-touch support combined are summarised below. The most meaningful measure of the value of the programme is to consider the lifetime attributed impacts of our interventions, which considers both the *extent* to which we have improved outcomes (and is thus a better measure of our additional value) and the *length of time* we think changes will persist for. The **attributed lifetime impacts** resulting from in-depth and light-touch support in 2016-17 were<sup>1</sup>:

- **130,000 MWh of energy savings**
- **160,000 m<sup>3</sup> of water savings**
- **12,000 tonnes of reduced material consumption**
- **42,000 tonnes of reduced waste outputs** - of which 26,000 tonnes resulted from waste prevention and 80 tonnes was food waste
- **65,000 tonnes of CO<sub>2</sub>eq savings** - of which 48,000 tonnes come from energy measures, counted on a territorial basis, and 17,000 tonnes come from material savings, counted on a lifecycle basis
- **£15 million in cost savings** - of which £12 million comes from energy measures, £0.4 million comes from water measures, and £2.8 million comes from material measures

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<sup>1</sup> Summed impacts of light touch and in-depth support are rounded to two significant figures and therefore do not sum in all cases

Other notable quantified benefits from RES-ASS support in 2016-17 include:

- **Influencing around 350 jobs** – of which 100 were created and 250 safeguarded through our interventions.
- **Influencing just under £45 million in capital investment**

Wider learning from this year's evaluation includes the following:

**The evaluation contractor received overwhelmingly positive feedback about the support RES provided.** A large majority of beneficiaries were satisfied or very satisfied with the service they received. Support helps raise awareness of resource efficiency opportunities, make the case for change and access sources of funding and support. Some beneficiaries would have liked more follow-up, or expected support to be more directly linked to funding.

**Some organisations believe implementing resource efficiency measures has transformed how they operate.** Most businesses view the benefits in terms of quite straightforward reductions in day to day costs. However, some businesses directly attribute resource efficiency measures to an ability to operate an extended opening season (where previously they would close on economic grounds). Others believe that the implementation of resource efficiency measures has enabled them to operate more competitively and supported jobs.

**Financial constraints are typically cited as the reason for not implementing recommendations.** However, access to internal or external funding is only one factor. Some organisations believed the upfront costs of investment were too high and/or payback periods were too long. Where organisations cited finance as a barrier, there is typically a reluctance to take out a loan, with most citing a preference for at least a partial grant.

**Quantifying the impacts of light touch support and the implementation of related actions<sup>2</sup> remains challenging.** Where light-touch beneficiaries are unable to provide usable data (bills etc), we do not estimate impacts. During the evaluation of in-depth support, we do not estimate the savings associated with a resource efficiency measure *related to* the original recommendation made by the advisor.

**Reported jobs benefits should be treated as indicative.** We know from a recent study covering a longer period that the beneficiary's perspective regarding the role of resource efficiency measures in creating or safeguarding jobs changes over time. We would highlight this is not our net benefit in employment terms, due to the likelihood of displacement.

**Additional implementation is likely to take place over a longer time frame.** In the current work a significant number of measures were reported as still under consideration (rather than outright rejection). This reflects the findings from a recent study of RES beneficiaries over a longer period, which suggested that some measures that were initially not taken forward at the time of impact evaluation (6-18 months following support) are often revisited later (2+years).

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<sup>2</sup> For example, the advisor might recommend new lighting, but the beneficiary installs sensors to better manage existing lighting. In this case, where the advisor has not quantified the potential savings associated with installing the sensors (i.e as an *alternative recommendation*), estimating impacts remains challenging.

## 2 Background and Context

### 2.1 About Zero Waste Scotland

Zero Waste Scotland Ltd (Zero Waste Scotland) is Scotland's resource efficiency and circular economy expert. Funded by The Scottish Government, we are a company limited by guarantee and governed by a Board of non-executive Directors.

Zero Waste Scotland exists to create a society where resources are valued and nothing is wasted. Our goal is to help Scotland realise the economic, environmental and social benefits of making best use of the world's limited natural resources. We are funded to support delivery of the Scottish Government's circular economy strategy and the EU's 2020 growth strategy.

Zero Waste Scotland is committed to evaluating the outcomes and impacts resulting from our work. We have an in-house evaluation team that supports programme monitoring and manages our evaluation activity.

### 2.2 About Resource Efficient Scotland

Resource Efficient Scotland (RES) is a programme delivered by Zero Waste Scotland, our funding comes from the Scottish Government and the European Regional Development Fund. The programme offers free advice and technical support as well as the sharing of best practices and new technologies.

The programme helps organisations reduce costs by saving energy and water, reducing raw materials use and managing waste efficiently. Embedding resource efficiency within Scottish organisations makes a significant contribution to the achievement of the Scottish Government's strategic economic objectives, climate change, energy efficiency and zero waste targets.

### 2.3 Which activities were included in the evaluation?

The evaluation focused on resource efficiency advice delivered in 2016-17 via the RES-advice and support hub (RES-Hub). An overview of each support type is provided below and a full list of the activities is provided in Appendix 1.

**RES-Hub “in-depth” support**, where a RES advisor provides detailed advice on resource efficiency measures to small and medium enterprises (SME's). Advice is provided through site visits or over the telephone. The advice generates a list of identified measures and associated savings, which are then used to produce a client report and a savings dataset for use during the evaluation. All the assessments produce a set of core recommendations. The advisor may also identify alternative recommendations (e.g install a different type of boiler or similar) and further recommendations (normally longer term and more speculative in nature).

**RES-Hub “light-touch” support** refers to a wide range of face-to-face training, web-based tools and telephone advice delivered by the RES-Hub. Targeted support is focused on SME's, but larger organisations are not restricted from accessing web tools. Activity is used to direct beneficiaries to in-depth support.

In contrast to in-depth support, advice tends to be more generic in nature and quantified savings for a specific company/site are not normally generated. We also have very little supporting information about the organisation prior to impact evaluation (e.g employee numbers, activity sector).

### 2.4 Summary of the evaluation methodology

In July 2017 we commissioned an independent contractor via a competitive tendering process (Databuild Ltd) to conduct an impact evaluation of the activities in Section 2.3. The evaluation ran between August and December 2016 and beneficiary interviews were conducted between late

September and early November. The current evaluation built on our experience of previous impact evaluations of advice services since 2014. A key objective was to conduct a methodology that was comparable to previous years.

The evaluation methodology consisted of two types of telephone interview and analysis with a sample of supported organisations. Beneficiary contact lists go through a process of de-duplication; where duplication was found beneficiaries were interviewed based on the most intensive support they received. Where a beneficiary has utilised both light touch and in-depth support any actions reported during interview will normally be counted under in-depth support<sup>3</sup>.

Interview sampling for in-depth support was driven by analysis of the identified savings dataset, enabling us to target and report on the coverage of the total identified savings “pool”. By contrast, for light touch support we normally have only basic contact details, which limits our sampling to trying to achieve a broadly similar percentage of the total population for each light-touch activity type.

During interview all beneficiaries were asked about any actions taken since using RES support, the impact on their organisation of actions taken, and the degree to which they felt RES support had influenced the outcome. For in-depth support we asked beneficiaries about the status of core, alternative and further recommendations in the savings dataset and this was used as the basis for impact calculations. The identified savings associated with further recommendations are not used to calculate implementation rates<sup>4</sup>.

During all interviews we counted actions that were already implemented, partially implemented, or planned with a high degree of confidence. Where actions are planned, a downwards adjustment is made to account for some plans that may not progress<sup>5</sup>. The evaluation excludes actions where there is no evidence of plans in place.

The interview also captured quantitative and qualitative evidence on areas such as reasons for seeking advice, actions taken, impacts on jobs, barriers to taking action and feedback on support provided.

Post-interview analysis included the calculation of implementation rates (in-depth support only<sup>6</sup>), estimates of whole population impacts from sampled populations and the translation of primary metrics (e.g tonnes of glass recycled) into our resource efficiency metrics (e.g the carbon impact of recycling glass).

We report quantified impacts of RES-Hub support across several resource efficiency metrics. Further details of the metrics used in this report, including what is counted and excluded, are provided in Appendix 2.

We split cost savings into those attributed to energy, water or material actions taken. We have also provided the combined cost savings resulting energy, water and materials. The current evaluation is not a cost-benefit analysis, though the data collected could inform any future exercise of this type. We do not monetise non-financial benefits (such as carbon savings), so cost savings normally represent direct financial savings to the organisation<sup>7</sup>. We also count aspects such as cost savings in line with our strategic ask from government (for example landfill tax savings are a benefit to the businesses we target and are counted in our cost savings method).

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<sup>3</sup> In the great majority of cases we think it is unrealistic to expect beneficiaries who have used both in-depth and light touch support to be able to disaggregate the impact of each support type.

<sup>4</sup> We think the more speculative nature of further recommendations means they are less useful to combine with core recommendations when calculating implementation rates.

<sup>5</sup> We conducted a small qualitative project with RES-Hub beneficiaries in early 2017 to identify the nature and scale of actions taken over a longer time frame than our current impact evaluation methodology. Evidence suggests that our downwards adjustment of 50% for planned actions is reflective of what happens over a 2-3 year period after support.

<sup>6</sup> Identified savings and implementation rates are not available for light-touch support, as potential savings are not quantified at the point support is offered.

<sup>7</sup> In the case of increased recycling of a material, we assume a monetary value at the re-processor “in-gate”, but in practice this value is likely to fall in the wider economy, rather than with the beneficiary we supported.

Jobs and capital investment are considered as one-off impacts for the purposes of this impact assessment and we make no assumption about long-term impact. Job impacts are based on feedback from supported organisations, and no adjustment is made for either displacement or multiplier effects.

In Sections 3 and 4 we report quantified impacts on an annual and lifetime basis. Appendix 3 explains how we calculate annual and lifetime impacts. We also report quantified impacts as *gross*, *influenced* and *attributed*. Appendix 4 explains the basis of gross, influenced and attributed impacts.

A more detailed description of the methodology used in the evaluation is available on request.

### 3 Impacts of RES-Hub in-depth support

The following section summarises the impacts of all RES-Hub in-depth support delivered in 2016-17. For brevity we report combined impacts for all in-depth support listed in Appendix 1. Impacts for each support type are available on request.

#### 3.1 Interview coverage

There were 610 organisations who had received in-depth support. In total 150 full telephone interviews were completed. A further 12 organisations were unable to carry out a full interview, but were willing to complete a pre-completed note where they were asked to record the status of recommendations. We therefore obtained information on the status of recommendations for 162 organisations, and more detailed feedback from lengthier interview for 150 organisations.

Of the approximately 3000 recommendations within the identified savings dataset, 720 were followed up in total, of which 629 were covered in detail in a full telephone interview. The status of the remaining 91 measures were reported by beneficiaries using the pre-completed note via email.

Of the total identified savings quantified within the 2016-17 dataset, the evaluation covered 44% of combined cost savings, 51% of combined carbon savings and 44% of energy savings.

#### 3.2 Types of recommendation and their status from interview

Appendix 4 provides a summary of the number and type of recommendations covered by the impact evaluation and their status from interviews.

Where more than 40 individual measures had been covered during interview, the most likely types of recommendations to be taken forward **in full** were general energy efficiency dominated by lighting / insulation (32% of 230), waste (30% of 44) and building fabric (21% of 95). The least likely recommendations to be taken forward **in full** were water efficiency (18% of 65), Space heating/hot water - which are typically higher cost and more disruptive (15% of 112) and renewables (8% of 119).

#### 3.3 Implementation rates from in-depth support

We measure and report implementation rates in the three distinct ways described below. Each method provides distinct information about patterns of implementation.

##### 3.3.1 *The proportion of all beneficiaries taking at least one action*

Of the 162 beneficiaries for which we obtained the status of recommendations, 126 (or 78%) had taken action or had definite plans to take action at the time of the evaluation.

##### 3.3.2 *The proportion of recommendations that were implemented*

Of the 720 recommendations that were followed up, 364 (51%) had been taken forward in total, of which 205 (29%) had been taken in full or in part; for a further 159 (22%) there are definite plans to take them forward. For a further 38 recommendations, beneficiaries reported implementing an alternative to that recommended by the RES advisor. This usually involved the installation of systems with a similar objective, but to a different specification or scale.

*“We have installed sensors with the existing lights rather than the LED” (Recommended measure: replace lighting with LED equivalents)*

Where related actions have been taken, we have not estimated impacts and gross savings are therefore likely an under-estimate of action taken.

### 3.3.3 The proportion of quantified savings implemented

The proportion of quantified cost, carbon and energy savings implemented/likely to be implemented are summarised in Table 3.1 below. Combined cost and carbon savings are the result of the implementation rate of the full list of RES identified energy, water, waste and raw material-related recommendations within a report.

Savings metric	Units	Implementation rate (%)
At least one measure taken		78
Combined cost savings	£	41
Combined carbon savings	£	32
Energy savings	kWh	21
Waste savings	Tonnes	54
Raw materials savings	Tonnes	82
Water savings	Cubic metres	55

**Table 3.1 Implementation rates (based on quantified savings implemented) for RES-Hub in-depth support in 2016-17**

Implementation rates based on quantified savings are prone to the interactive effects of some recommendation types. For example, where renewable measures have been implemented, carbon and cost savings might result, but there is an increase in energy consumption. Therefore, the make-up of recommendation types identified in any given year is likely to drive some of the variation in implementation rates we obtain from evaluation.

The other factor to consider for implementation rates calculated using quantified savings is the tendency for a relatively small number of recommendations associated with large identified savings to have a disproportionately large impact on the overall calculation.

The combined cost savings implementation rate is significantly higher (41%) compared to the energy savings implementation rate (21%). This is because the cost savings associated with waste and raw materials have played a relatively significant role in overall cost savings in 2016-17<sup>8</sup>. The relatively high level of implementation of waste and raw material recommendations is largely driven by beneficiaries of both a RES site audit and waste prevention grant funding<sup>9</sup>.

The implementation rate for combined carbon savings is more closely linked to the implementation of energy savings (KWh). This is because energy-related carbon savings dominate combined carbon savings in the identified savings dataset (energy-related carbon savings made up 88% of all identified carbon savings combined).

## 3.4 The role of RES support

Of the 126 organisations that had taken action or had definite plans to take action at the time of the evaluation, 103 (or 82%) said that the support of RES had improved the outcome to some extent, and

<sup>8</sup> In 2016-17 cost savings associated with material savings comprised approximately 26% of all cost savings (i.e from energy, waste, material and water combined) – see Table 3.2.

<sup>9</sup> In 2016-17 of the £2.3 million of lifetime attributed cost savings associated with waste/materials, approximately £830,000 (or 36%) were associated with waste prevention grant beneficiaries.

just over half (52% or 65) reported that the changes were unlikely to have happened in the absence of advice/support. In total 23 (18%) organisations that had taken action thought that action would still have been taken in the absence of RES support. Where organisations thought that action would still have been taken in the absence of RES support, this was typically because the organisation had sought other advice, and/or were in the process of refurbishment and would have implemented measures as part of this process.

### 3.5 Reasons for not taking action

For organisations completing a telephone interview and reporting they had no definite plans to take measures forward (264 recommendations in total), respondents were asked why they had not taken action.

In total, 36 (14%) had not been completely rejected by respondents and *they may be considered in the future*. This is in line with findings from a separate study of implementation by RES beneficiaries over a longer period, which suggests that further savings may be realised in future years.

Financial barriers were the most commonly cited reason for not implementing recommendations at the time of the evaluation. Where respondents cited finance as a barrier<sup>10</sup>, they were asked for further details. A lack of internal funding was cited for 38 (14%) recommendations, and the recommendation was judged too expensive in 30 (11%) of cases. Payback was considered too long for 29 (11%) recommendations and an inability to raise money from grants was cited for 26 (10%) recommendations.

In practice, we think it's unlikely there is a single definitive "financial barrier" in most circumstances.

In addition to finance, a relatively small number (17 or 6%) of recommendations were not implemented as the respondents did not believe they were technically viable for their premises.

*"We ruled this out as it is a historic building and there are only certain parts of the roof we could put PV on which meant we didn't have enough south facing roof space to make it financially viable."  
(Recommended measure: PV array)*

A further 13 (5%) of recommendations were not implemented due to practical constraints such as patterns of building usage.

*"...the hall doesn't have regular use. We might only use it twice a month and you can't set a timer for that. We could use a remote but you need Wi-Fi for that." (Recommended measure: Adding timers and thermostats to existing electric heaters)*

A further 13 (5%) of recommendations were not implemented as respondents did not wish to replace current working equipment or systems.

*"The boilers are not anywhere near the end of their life and it does not make economic sense to replace them yet." (Recommended measure: installation of two new condensing boilers)*

In our sample restrictive rental contracts was cited for only 10 (4%) of the recommendations not implemented.

### 3.6 Quantified impacts

Table 3.2 below summarises the combined impacts of all RES-Hub in-depth support delivered in 2016-17. We typically report impacts to our funders based on *lifetime attributed* impacts (grey shading in table below), as this is the most meaningful measure of the value of the programme. Lifetime attributed impacts consider both the *extent* to which we have improved outcomes (and is thus a better measure of our additional value) and the *length of time* we think changes will persist for.

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<sup>10</sup> This question was asked as a multiple response, organisations were therefore able to cite more than one reason for not implementing recommendations. Responses were captured as an open end and coded.

For a description of gross, influenced and attributed impacts, and how we calculate annual and lifetime impacts, please see Appendix 3 and 4 respectively. For a description of the resource efficiency metrics please see Appendix 2.

Resource efficiency metric	Units	Annual gross	Annual influenced	Lifetime gross	Lifetime attributed
Reduced energy use	MWh	19,000,000	17,000,000	120,000,000	100,000,000
Carbon savings from energy	tCO <sub>2</sub> eq	8,000	6,700	52,000	38,000
Cost savings from energy	Pounds	2,000,000	1,700,000	12,000,000	8,700,000
Reduced water use	m <sup>3</sup>	34,000	34,000	160,000	120,000
Cost savings from water	Pounds	95,000	95,000	440,000	340,000
Reduced material consumption	Tonnes	2,000	2,000	9,100	8,600
Reduced waste outputs	Tonnes	9,300	9,300	44,000	36,000
....of which waste prevention	Tonnes	5,900	5,900	28,000	26,000
....of which food waste	Tonnes	50	50	240	80
Carbon savings from materials	tCO <sub>2</sub> eq	2,100	2,100	10,000	6,300
Cost savings from materials	Pounds	710,000	710,000	3,300,000	2,300,000
Jobs created	FTEs	90	60	n/a	n/a
Jobs safeguarded	FTEs	190	190	n/a	n/a
Capital investment	Pounds	8,600,000	6,900,000	n/a	n/a
<i>Combined cost savings<sup>11</sup></i>	Pounds	2,800,000	2,500,000	16,000,000	11,000,000
<i>Combined carbon savings</i>	tCO <sub>2</sub> eq	10,000	8,800	62,000	44,000

**Table 3.2 Impacts of RES-Hub in-depth support delivered in 2016-17. All data rounded to two significant figures and therefore will not sum in all cases. n/a denotes where we do not measure on a lifetime basis.**

The findings in Table 3.2 overlap to some extent with the impact of the Scottish Government SME loan scheme delivered by the Energy Savings Trust (EST). In these cases, financing was provided via EST,

<sup>11</sup> The total cost savings resulting from energy, water and material

but our evaluation has included the technical review delivered by the RES-Hub. This means the two streams of government financing have contributed to the same impacts and these impacts are counted in the totals above for in-depth support. To provide a sense of scale, of the £11m lifetime attributed cost savings from in-depth support, just under £230,000 was associated with measures funded via the loan scheme. Reduced energy use totalled 100,000 MWh on a lifetime attributed basis, of which the loan scheme delivered 2,300 MWh.

## 4 Impacts of RES-Hub light-touch support

The following section summarises the impacts of light-touch support delivered by RES-Hub in 2016-17. For brevity we report combined impacts across all light-touch activities. The individual activity types are listed in Appendix 1 and separate impacts are available on request.

### 4.1 Interview coverage

Prior to interview and subsequent analysis, the light-touch beneficiary contact details provided are firstly checked for the validity of contact details and duplication with the in-depth support datasets. Organisations using both light-touch support and in-depth support are interviewed based on in-depth support they received and are removed from all subsequent light-touch analysis.

The total number of unique organisations with valid contact details accessing light-touch support was 1,462. The population is then further adjusted for interview call outcomes that we wish to exclude from scaling estimates (e.g no longer in business, line disconnected, do not recall accessing support). Following the removal of organisations based on call outcomes, full interviews were completed with 165 unique organisations who collectively had 232 instances of light-touch support (some organisations utilise more than one support type).

### 4.2 Action taken and the role of RES support

In total, 94 (57%) of the organisations that had used light-touch support had taken or were planning to take action. The most common types of action taken following RES support were related to reducing energy consumption (39%) and improvements to waste management (29%).

When asked about the role of light-touch support in taking action, 70 (75%) said that RES support had improved the outcome to some extent, whereas 24 (25%) thought that action would still have been taken in the absence of RES support. Where the role of RES support was not attributed to taking action, there was no obvious difference between organisation type or similar.

### 4.3 Reasons for not taking action

Frequently cited reasons for not taking action by beneficiaries included lack of finance, using the support for more general advice on resource efficiency, a reluctance from decision makers to take action, and the information provided was not applicable to their circumstances. Some beneficiaries suggested they were already doing what was recommended to them.

### 4.4 Quantified impacts

Resource efficiency metric	Units	Annual gross	Annual influenced	Lifetime gross	Lifetime attributed
Reduced energy use	MWh	9,900,000	8,800,000	99,000,000	34,000,000
Carbon savings from energy	tCO <sub>2</sub> eq	3,200	2,800	32,000	9,900
Cost savings from energy	Pounds	1,000,000	920,000	10,000,000	3,000,000

Reduced water use	m3	35,000	22,000	140,000	37,000
Cost savings from water	Pounds	84,000	55,000	340,000	100,000
Reduced material consumption	Tonnes	2,900	2,800	14,000	3,700
Reduced waste outputs	Tonnes	3,900	3,900	19,000	6,100
...of which waste prevention	Tonnes	60	50	250	210
...of which food waste	Tonnes	-	-	-	-
Carbon savings from materials	tCO <sub>2</sub> eq	6,900	6,700	33,000	11,000
Cost savings from materials	Pounds	340,000	340,000	1,600,000	530,000
Jobs created	FTEs	60	40	n/a	n/a
Jobs safeguarded	FTEs	120	50	n/a	n/a
Capital investment	Pounds	41,000,000	39,000,000	n/a	n/a
<i>Combined cost savings</i>	Pounds	1,500,000	1,300,000	12,000,000	3,800,000
<i>Combined carbon savings</i>	tCO <sub>2</sub> eq	10,000	9,500	65,000	21,000

Table 4.1 below summarises the combined impacts of all RES-ASS light-touch support delivered in 2016-17. We typically report impacts to funders based on *lifetime attributed* impacts (grey shading in table below), as this is the most meaningful measure of the value of the programme. Lifetime attributed impacts consider both the *extent* to which we have improved outcomes (and is thus a better measure of our additional value) and the *length of time* we think changes will persist for.

For a description of gross, influenced and attributed impacts, and how we calculate annual and lifetime impacts, please see Appendix 3 and 4 respectively. For a description of the resource efficiency metrics please see Appendix 2.

Resource efficiency metric	Units	Annual gross	Annual influenced	Lifetime gross	Lifetime attributed
Reduced energy use	MWh	9,900,000	8,800,000	99,000,000	34,000,000
Carbon savings from energy	tCO <sub>2</sub> eq	3,200	2,800	32,000	9,900
Cost savings from energy	Pounds	1,000,000	920,000	10,000,000	3,000,000
Reduced water use	m <sup>3</sup>	35,000	22,000	140,000	37,000
Cost savings from water	Pounds	84,000	55,000	340,000	100,000
Reduced material consumption	Tonnes	2,900	2,800	14,000	3,700
Reduced waste outputs	Tonnes	3,900	3,900	19,000	6,100
...of which waste prevention	Tonnes	60	50	250	210
...of which food waste	Tonnes	-	-	-	-
Carbon savings from materials	tCO <sub>2</sub> eq	6,900	6,700	33,000	11,000
Cost savings from materials	Pounds	340,000	340,000	1,600,000	530,000
Jobs created	FTEs	60	40	n/a	n/a
Jobs safeguarded	FTEs	120	50	n/a	n/a
Capital investment	Pounds	41,000,000	39,000,000	n/a	n/a
<i>Combined cost savings<sup>12</sup></i>	Pounds	1,500,000	1,300,000	12,000,000	3,800,000
<i>Combined carbon savings</i>	tCO <sub>2</sub> eq	10,000	9,500	65,000	21,000

**Table 4.1 Impacts of RES-Hub light-touch support delivered in 2016-17. All data rounded to two significant figures and therefore will not sum in all cases. n/a denotes where we do not measure on a lifetime basis.**

<sup>12</sup> The total cost savings resulting from energy, water and material

## 5 What have we learned from this year's evaluation?

### 5.1 Satisfaction with the RES service

**The evaluation contractor received overwhelmingly positive feedback about the support RES provided.**

A large majority of beneficiaries were satisfied or very satisfied with the service they received. Many beneficiaries felt that the advice provided by RES had helped to raise awareness of resource efficiency opportunities in their organisation and make the case for change.

*"We needed their expertise to convince the board to make the changes now rather than on an ad hoc basis"*

Those receiving financial support (SME loan or waste prevention grant) expressed that they would not be able to take action without funding. Beneficiaries also highlighted that RES support had helped them access alternative sources of funding.

*"I believe that RES was fairly critical in helping us secure the other sources of funding."*

This year's evaluation of light-touch support also found evidence of a signposting role to other government priorities e.g advice on electric vehicles.

Where beneficiaries suggested they would have taken action regardless of RES advice, many still suggested it would still have taken them longer without the support.

In the relatively rare cases where beneficiaries appeared critical of RES support, this was typically related to an expectation that they would be able to access funding. This was most frequently expressed by organisations who had hoped to secure an SME loan but were subsequently deemed ineligible due to failure of credit check or not having been trading for 1 year.

Some beneficiaries would have liked more follow-up after receiving a written report or participating in light-touch support. Consistent with previous years some beneficiaries felt that the advice provided was unable to fully solve their problem (due to practical/technical constraints).

### 5.2 The value of resource efficiency

**Some organisations believe implementing resource efficiency measures has transformed how they operate.**

Most businesses view the benefits in terms of quite straightforward reductions in day to day energy or waste management costs. However, some businesses directly attribute resource efficiency measures to an ability to operate an extended opening season (where previously they would close on economic grounds). Others believe that the implementation of resource efficiency measures has enabled them to operate more competitively and supported jobs.

### 5.3 Barriers to implementation

**Financial constraints are typically cited as the reason for not implementing recommendations.**

However, access to internal or external funding is only one factor. Some organisations believed the upfront costs of investment were too high and/or payback periods were too long. Where organisations cited finance as a barrier, there is typically a reluctance to take out a loan, with most citing a preference for at least a partial grant.

We thought that other contextual factors might have been raised by beneficiaries (e.g investment uncertainty associated with Brexit), but the evidence from our interviews does not support this.

## 5.4 Challenges for the evaluation

### 5.4.1 *Jobs figures should be treated as indicative only*

We know from a recent study over a longer time period that the beneficiary's perspective regarding the role of resource efficiency measures in creating or safeguarding jobs changes over time. It continues to be challenging to get a rich understanding of job creation and safe-guarding in the context of what is a relatively short telephone survey. We have attempted to improve the information captured during interview, but there is probably a natural limit without additional qualitative follow-up where jobs are claimed.

### 5.4.2 *Quantifying the impacts of light-touch support remains a challenge*

The nature of the light-touch support means that we don't have detailed information available during the evaluation interview on the scale of potential savings. Where beneficiaries are unable to provide usable data (bills etc) regarding the impacts of action taken, we do not estimate impacts. This has been a consistent approach in our evaluation methodology for several years.

This means the reported impacts of light-touch activity are likely to be an underestimate. We are currently reviewing our evaluation methodology and datasets to better understand if reliable proxies are available.

### 5.4.3 *Quantifying the impacts of related actions*

During the evaluation of in-depth support, we ask beneficiaries about the implementation of all recommendations listed in the savings dataset. We also ask whether any measures related to the recommendations suggested by the advisor have been implemented. There were 38 recommendations in this year's evaluation where a related action had been taken. For example, the advisor might recommend new lighting, but the beneficiary installs sensors to better manage existing lighting.

In these cases, we do not estimate savings and the reported impacts of in-depth support are likely to be an underestimate. It remains challenging to conduct what would be a revised technical assessment over the telephone, as the evaluation interviewers do not possess the technical expertise to do this.

### 5.4.4 *Additional implementation is likely to take place over a longer time frame*

In the current work a significant number of measures were reported as still under consideration (rather than outright rejection). This reflects the findings from a recent study of RES beneficiaries over a longer period, which suggested that some measures that were initially 'rejected' at the time of impact evaluation (6-18 months following support) are often revisited later (2+years).

For future evaluations we may capture and report the status of "still under consideration" as distinct from a clear rejection of the measure. The timing of impact evaluation is a necessary trade-off between timely reporting to funders and what we know about action taken over a longer time frame.

## 6 Appendix 1 List of activities included in the evaluation

### RES-Hub in-depth support

- Multi-Day Support
- Large Savings Projects
- Telephone Audit
- Direct Technical Support
- RES-Hub/SG-SME loan scheme<sup>13</sup> - loan measure only
- RES-Hub/SG-SME loan scheme - loan measure & additional measures
- RES-hub Implementation Support<sup>14</sup>

### RES-Hub light-touch support

- Hub enquiries
- Savings finder
- Resource Efficiency pledges
- RES Webinars
- RES Workshops
- RES Green Champions workshops
- RES Green Champions online
- RES breakfast briefings

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<sup>13</sup> Scottish Government SME loans scheme - where financing was provided via the EST and the technical review was delivered by RES-Hub. The technical review either focuses solely on the loan measure, or might also identify additional measures (i.e those not funded by the loan).

<sup>14</sup> Where a RES-Hub beneficiary has utilised both an initial assessment and follow up implementation support

## 7 Appendix 2 Defining the resource efficiency metrics used in this report

Further details of the individual resource efficiency metrics used in this report are provided below.

**Reduced energy use** - organisations we support use less electricity, gas, oil or other fuels. We count the reductions in energy consumption by Scottish businesses at their premises. We do not consider transmission losses, primary energy consumption, embedded energy, energy savings outside Scotland and transport.

**Carbon savings from energy** - organisations we support reduce their carbon footprint as a result of reduced energy use and changes in fuel types. We follow the same principles as reduced energy use. We use UK government carbon conversion factors (energy source) used in UK climate change reporting.

**Cost savings for energy** - organisations we support pay less for energy (reduced consumption or changed fuel mix). This includes income streams where appropriate (e.g. feed-in tariff) but may be offset by changes to running costs.

**Reduced water use** – organisations we support use less water. We consider on-site savings in Scotland only. We exclude transmission losses and any energy and carbon savings associated with water savings (e.g. water treatment and pumping). Any on-site savings from pumping/treatment should be measured directly as reduced energy use and associated cost savings.

**Cost savings from water** - organisations we support pay less for water (based on changes above). We use the charges levied on a business by Scottish water for both potable water consumption and waste water treatment.

**Reduced material consumption** - organisations we support use less raw material and/or the material recycled by organisations we support reduces global demand for raw material. May include reduced inputs on-site in Scotland (reduced consumption or use of recycled material), and displacement of virgin materials as a result of increased recycling/movement of materials up the waste hierarchy.

**Reduced waste outputs** – our support results in less material going to waste. This includes outputs on-site in Scotland, even if tonnages are ultimately managed elsewhere. We include changes to products (such as light-weighting or design for longevity), recycling, composting, anaerobic digestion, reuse, preparation for reuse and waste prevention. We count materials that do not go to waste (this is broader than the legal definition of “material managed as waste”). We exclude transitions from landfill to incineration as this is beyond our remit.

**Carbon savings from materials** – organisations we support reduce waste or material consumption, as a result Scotland’s carbon footprint from material use is reduced. We use the Scottish Carbon metric (Global footprint lifecycle benefits), for a given material and intervention type.

**Cost savings from materials** - organisations we support pay less for materials or disposal. Depending on the nature of the intervention we include the price of recycled and virgin raw materials, waste management gate fees, landfill tax and transport costs. Cost savings may be offset by changes to running costs.

**Jobs created** – organisations we support create a new role, either through a specific resource efficiency post, or via competitive advantage/growth resulting from efficiency savings. We do not consider public sector employment and net employment (e.g. multipliers/displacement).

**Jobs safeguarded** – jobs that would have been at risk are secured due to cost savings/competitive advantages gained from resource efficiency measures or other interventions. We do not consider public sector employment and net employment (e.g. multipliers/displacement).

**Capital investment** - organisations we support invest in resource efficiency measures through one-off expenditure. We exclude public sector investment from our reporting. Ongoing running costs (both positive and negative) are reflected in cost savings described above.

## 8 Appendix 3 How we calculate annual and lifetime impacts

*Annual impacts* are the quantified benefits of implementing resource efficiency measures, for a single year following implementation. For example, we provide advice to upgrade a heating system and the client implements the changes. The energy, cost and carbon savings resulting from implementation are then calculated for a single year after implementation. Annual impacts do not make any assumptions about how long the heating system upgrade will continue to deliver savings.

*Lifetime impacts* consider the length of time we think implemented savings will persist for. To calculate lifetime impacts we apply assumptions about the persistence of an intervention. Typically, this is one to two years for behaviour change measures alone; five years in most other cases; and 10 years for investments in infrastructure or physical kit. We stop claiming credit for impacts after 10 years; while benefits may accrue beyond this period, our claim to have “caused” them becomes weaker over time, irrespective of the actual lifespan of the change. Net present value is accounted for in lifetime cost savings.

*Lifetime attributed impacts* consider both the *extent* to which RES support has improved outcomes (and is thus a better measure of additional value) and the *length of time* we think changes will persist for.

## 9 Appendix 4 How we calculate gross, influenced and attributed impacts

We report each resource efficiency metric according to how beneficiaries report the role of RES support in helping them take action. A brief description of gross, influenced and attributed impacts is provided below.

**Gross impacts** are those associated with all resource efficiency actions undertaken by beneficiaries, regardless of whether our support is credited with influencing the outcome or not. We use gross impacts to calculate implementation rates for in-depth support.

**Influenced impacts** are the proportion of gross impacts where beneficiaries credit our support with improving outcomes to any extent. Where a beneficiary tells us that our support did not help them or they would have taken action regardless of RES support, we do not count those impacts here.

**Attributed impacts** apply a higher burden of proof regarding the role of RES support where action was taken – essentially making an allowance for the *extent* to which our support made a difference.

The differences between gross, influenced and attributed impacts are summarised in **Error! Reference source not found..**

Beneficiary view on the extent to which RES has contributed to outcomes	Gross impacts (%)	Extent to which we claim "influence" (%)	Extent to which we claim "attribution" (%)
Unlikely to have happened without RES support	100	100	100
A lot better as a result of RES support	100	100	50
A little better as a result of RES support	100	100	25
Likely to have happened in the absence of RES support	100	0	0

**Table 9.1 How we attribute RES impact based on beneficiary response from interview**

## 10 Appendix 5 Recommendations from in-depth support and their status

Type recommendation	of	Number covered by interview	Taken in full	Partly taken the action	Definite plans to take the action	Not taken the action and no plans to take action	Don't know	Related action taken
Building fabric		95	21%	4%	23%	47%	1%	3%
Energy efficiency <sup>15</sup>		230	32%	5%	26%	30%	3%	4%
Renewables		119	8%	1%	23%	54%	8%	7%
Space heating/hot water		112	15%	4%	20%	44%	8%	9%
Waste		44	30%	9%	16%	30%	5%	11%
Water efficiency		65	18%	9%	23%	45%	3%	2%
Contract review (all RE)		5	80%	20%	0%	0%	0%	0%
Measuring monitoring	and	20	30%	25%	10%	25%	10%	0%
Staff training engagement	and	9	33%	22%	11%	22%	11%	0%
Other		21	38%	0%	19%	33%	5%	5%

**Table 10.1** *The type of recommendation, the number covered during interview and their status from evaluation, for RES-Hub in-depth support in 2016-17*

<sup>15</sup> In practice this category is typically dominated by lighting. Other categories will also deliver energy efficiency (e.g “building fabric”). The recommendation categories used during data capture and impact evaluation will be reviewed as part of lessons learned from this project.

