

South & East Ayrshire

**AREA BASED SCHEMES
WALL INSULATION EVALUATION**

**2015 –
2017**

**Executive
Summary**
Retrospective
Study (Part I)

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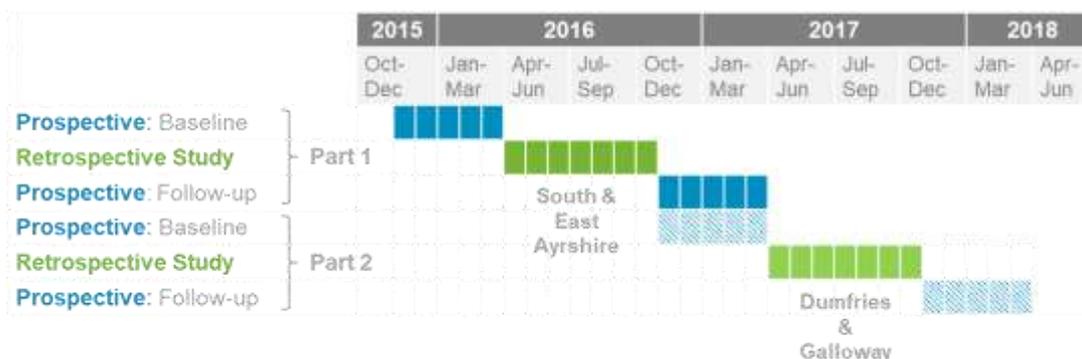
AREA BASED SCHEMES WALL INSULATION EVALUATION



Retrospective Study (Part 1): Executive Summary

Introduction:

- This report summarises some of the initial findings of a wider evaluation project, the aim of which is to investigate the impacts of insulation upgrades administered through the **Home Energy Efficiency Programme for Scotland Scheme (HEEPS): Area Based Schemes (ABS)**.
- The project is a collaboration between the **Energy Agency**; **NHS Ayrshire and Arran (Public Health)**; **South Ayrshire Council** and **East Ayrshire Council**.
- This part of the assessment (**Retrospective Study – Part 1**) was conducted on a sample of households, located throughout South and East Ayrshire, who had received insulation upgrades prior to the winter of **2015/2016**.



Methods:

- A total of **78 households** were recruited as part of the study giving an overall response rate of approximately **15%**
- The **target ratio** of privately owned properties to council or housing association properties of (**60:40**) was achieved
- **The retrospective assessment** involved gathering data from:



Face-to-face
Interviews with
the householders



Energy
Performance
Certificates (EPCs)

Results:

Property Conditions

- The majority of households gave positive comments regarding improvements to the condition of their home. Of those who received the insulation upgrades, **90%** agreed that the **appearance of their home** had *'improved a lot'* while **90%** also commented that their street or **neighbourhood** had improved
- 68% of participants who had reported having a problem with condensation or dampness said that this had now been improved following the works
- Prior to the insulation upgrades, the majority (**71%**) had an **energy efficiency rating** which was below the **national average**. Following the intervention, this figure was reduced to **17%** for South Ayrshire and **11%** for East Ayrshire
- Following the insulation upgrades, the **energy efficiency ratings** increased by **13 points** on average

"It's had a good impact....it makes the street look great. Everybody's happy and it makes you want to do stuff to the building to keep it nice"

EPC Data (Average Values)

	South Ayrshire			East Ayrshire		
	Pre-install EPC	Post-install EPC	% Change	Pre-install EPC	Post-install EPC	% Change
Primary Energy Indicator (kWh/m ² /year)	341	273	-20%	354	261	-26%
Energy Efficiency Rating (EER)	50	63	24%	56	68	22%
% with EER below national average (61)	71%	17%	-	71%	11%	-
Environmental Impact Rating (EIR)	46	58	27%	51	65	27%
% with EIR below national average (59)	71%	50%	-	76%	24%	-
Annual Fuel Costs (£)	£1,308	£944	-28%	£1,087	£799	-26%
Annual CO ₂ Emissions (tonnes)	6.0	4.4	-28%	4.8	3.5	-29%

Fuel Costs

- Prior to the insulation upgrades, the **mean monthly expenditure** on fuel was **£130** (± 50) compared to **£100** (± 30) following the insulation works. These figures are however subject to uncertainty are based mainly on self-reports from the householders
- For those who provided sufficient information, **34** properties reported seeing a reduction in their fuel bills while **7** hadn't noticed a difference and **1** had witnessed a slight increase
- Based on EPC data, prior to the intervention the mean annual fuel cost was **£1200** compared to **£870** following the insulation. This resulted in an average annual savings of **£360** for **South Ayrshire** and **£290** for **East Ayrshire**
- Based on the **EPC data**, the **fuel poverty** rate was **54%** prior to the works and had fallen to **35%** following the works.

“The bills kept going up and up and I knew that we had to do something about them...I think its better. It's more efficient now. It seems to hold the heating a bit longer”

Thermal Comfort

- **87%** of the participants agreed that their property was now able to **retain the heat** better following the insulation upgrades and **84%** found that their home now heated up more quickly
- A further **67%** of the householders felt that there was now a **more even distribution** of heat in the property while **68%** felt that they had **more control** of the temperature of their home
- **82%** of those interviewed felt that the overall temperature had increased. **50%** of the sample described their homes as **“much warmer”**
- The majority (**72%**) also felt that the insulation had improved their **level of thermal comfort** experienced in the home.

“I feel more relaxed at night...Rather than coming in here at night and having to wear a big jumper or a cardigan I can sit about like this and I feel quite comfortable”

Health

- **Individual health data** was obtained for a total of **81** participants.
- There were **10** reports of **improvements to existing conditions** which may have been linked to the intervention. These included problems with **bones, joints or muscles** (3), **COPD** (3), **asthma** (2) and **arthritis** (2)

“I think with the house being warmer its helped my arthritis a lot cause I'm not as sore now as I used to be... it has made a difference”

- There were a further **10** reports of **reduced colds/flu** and **10** reports of **improved mood or mental well-being**.

“With the dampness...its helps my breathing a lot dear and I sleep better”

“It makes me a lot happier. I think it’s a lot warmer so it lightens my mood”

Installation

- There were some mixed reports with regards to the installation process. Positive comments were made regarding the **efficiency** and the **work ethic** of specific contractors while negative comments were linked to issues with **mess, delays** and **communication**. Despite these issues, the majority (88%) stated that they would **recommend the scheme** to others.

“I would recommend it to anybody cause I really think they made a great job of it”

Conclusions

This report has summarised the findings from a retrospective study involving 78 households in South and East Ayrshire who had received external wall insulation as part of the HEEPS: ABS scheme. The recruited households had generally low incomes with high rates of relative poverty. The majority of households included either a child (under 16) or an elderly occupant.

A range of different property types were included allowing a broad assessment of factors which may have influenced the extent of improvement following the insulation. Despite the fact that all of the properties were targeted based on the assumed poor energy-efficiency, analysis of the pre-intervention EPC data in combination with reports from the householders revealed that there was considerable variation in terms of the baseline energy-efficiency. Nonetheless the majority of households (71%) had a below average EPC rating prior to the insulation works. Following the insulation works, this figure was reduced to 17% for South Ayrshire and 11% for East Ayrshire. The modelled fuel savings predicted by the EPCs also equated to approximately £360 and £290 per year

A comparison of the predicted improvements in performance and reports from the householders did however reveal various inconsistencies. This included both under-estimates and over-estimates of performance, most of which could be explained by the differences in the assumptions made by the EPC assessment and the realities of occupant behaviour. For example it was apparent from the household questionnaires that few of the properties were heated to the standard assumed in the EPC modelling. There was also evidence of the rebound effect whereby a proportion of the predicted savings were likely absorbed through increased consumption. Difficulties were also experienced in obtaining historic energy bills from the participants thereby limiting the number of properties for which the modelled and actual usage could be compared directly. The results from the interviews have therefore highlighted the complexity in determining the true impact of an intervention like wall insulation on fuel expenditure.

Area Based Schemes Evaluation – Retrospective Study (Part 1)

Additional benefits to the householders, beyond those relating to fuel costs, were also investigated. It was found that the majority had experienced an increase in the temperature of their home following the insulation upgrades. There was also a reduction in the need for coping strategies such as supplementary heating appliances. These are aspects that are not acknowledged in the EPC assessment. Furthermore, there were positive reports relating to the improved appearance of the property and general neighbourhood as well as a few reports of reduced noise. There was also some anecdotal evidence of improved health outcomes particularly in relation to respiratory conditions, mobility issues and mental well-being. Although these are not the primary aim of the scheme, they represent important secondary benefits.

In relation to any unintended consequences of the insulation, there was little evidence of any negative impacts with only one report of over-heating and one issue with mould which was related to an existing defect in the wall. It is however acknowledged even where there are no visible moisture problems, indoor air quality may still be comprised. Additional monitoring of relative humidity and CO₂ would therefore be useful in confirming that there are no negative impacts on the environmental conditions. For the actual installation process, although there were some mixed reports in relation to the contractors, the majority of participants were happy with the end results. With regards to possible defects in the installations, tools such as thermographic surveys may be useful in identifying any hidden thermal bridges or areas of poor workmanship, particular in households where the fuel savings or increases in temperature were lower than expected.

Finally, a basic cost analysis revealed that, based on the predicted reductions in energy consumption, for the majority of properties the initial costs of the works would be recouped through savings in fuel expenditure within the lifespan of the insulation. The payback periods were however much higher in some cases when the actual savings experienced by the householders were taken into account although these calculations were limited by the small sample size. There are however other financial benefits which, although not quantified at this stage, may contribute further to the cost-effectiveness of such a scheme.

Overall while the results presented here suggest a range of potential benefits resulting from the ABS scheme, the study is limited somewhat in its retrospective nature. The study will therefore be complimented with an ongoing prospective study and more detailed environmental monitoring, both of which are due for completion in Spring 2017.

This report was prepared by the Energy Agency in partnership with NHS Ayrshire & Arran, East Ayrshire Council and South Ayrshire Council.

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