Department for
Business, Energy
& Industrial Strategy

The impact of solid wall insulation on property value

Summary of findings of a pilot study conducted on social housing in Birmingham

BEIS Research Paper Number 2020/029

Conducted on behalf of BEIS by Purple Market Research (www.purplemr.co.uk)

April 2019

CONTENTS

GLOSSARY OF TERMS

External Wall Insulation / EWI	Insulation applied to the outside of walls of a property. The homes included in this study had Rockwool insulation fitted to the outside of the walls followed by a base coat render. In this report this has been referred to as 'EWI.'
Market value	As specified by RICS (using the International Valuation Standards definition), property market value is the estimated amount for which an asset or liability should exchange on the valuation date between a willing buyer and willing seller in an arm's length transaction after proper marketing, where the parties had each acted knowledgeably, prudently and without compulsion.
Solid Wall Insulation / SWI	Generic term for insulation applied to the walls of a property (either internally or externally).
Wimpey No Fines	The properties included in this study are of a non-standard concrete construction known as 'Wimpey No Fines.' The properties were built with a brick plinth and concrete walls of solid construction (hence their suitability for external wall insulation).

1. EXECUTIVE SUMMARY

1.1. This report

This report summarises the key findings of a research project conducted by Purple Market Research on behalf of the Department of Business, Energy and Industrial Strategy (BEIS) in 2018.

1.2. Project objectives

The aim of the research was to determine if the installation of solid wall insulation (SWI) can be demonstrated to add monetary value to a property. In this case the SWI took the form of *external wall insulation* (referred to as EWI in this report) installed in a small number of local authority housing properties in Birmingham.

The research acts as a pilot, in order to establish a methodology that can potentially be rolled out to assess whether an increase in property value can be attributed to EWI in a larger number of homes or used to determine if other energy efficiency measures increase the value of a property.

1.3. The process

EWI was installed in 45 local authority homes in the Birmingham area between May and August 2018.

Purple Market Research commissioned qualified surveyors to carry out valuations on 21 of these homes before and after the EWI was installed (and on a further 5 control properties where no EWI installation took place). Two of these homes were not valued after the installation of EWI, due to the unavailability of residents. Thus 19 homes were valued pre and post EWI installation, with the same surveyor carrying out both the pre and post EWI installation valuations in nine cases and different surveyors doing the pre and post installation valuations for the other ten properties.

Surveyors were asked to carry out valuations on the home as they would normally do, but assuming the properties were 'freehold on an unencumbered basis', meaning that properties were to be considered freehold, irrespective of property type, were empty, had no debt attached and were being offered for sale on the open market. Surveyors were not told the objective of the project (to determine if EWI adds value to a property), although most surveyors told us in the depth interviews that they were able to work out the aim of the exercise.

The process involved liaising with the installer, property residents and the surveyors to agree a valuation schedule. The whole process took over four months due to installation delays, the lead time required to book surveyors, delays receiving surveyor reports and the challenges of co-ordinating residents and surveyors.

1.4. The local property market

By carrying out valuations on five control homes (which did not have EWI installed) at the start and end of the research period, we found that there had been very little change in the average property value in that period. The conclusion that there had been no movement in the local property market was confirmed by surveyors in the in-depth interviews.

There was, therefore, no need to factor any general increases in the value of the properties due to market movements into the analysis.

1.5. Uplift in property value following installation of solid wall insulation

The mean property value across the 19 properties increased after EWI installation, from £93,895 prior to EWI installation to £96,868 post-installation, an uplift of £2,973 (3%).

There is a statistical margin of error associated with the change in value between the pre and post installation of EWI, in the form of a confidence interval. The confidence interval in this case indicates that the actual mean change in property value before and after the installation of EWI is a positive £2,973 +/- £5,836. That means that the change could be as high as £8,808 (a 9% increase), but it could also be a decrease in value of £2,860 (a drop of 3% in value).

We can therefore conclude that the uplift in value is *not* statistically significant. This is not surprising, given that the data is based on a small sample of 19 homes. Indeed, in a new survey, for a mean increase in value of £2,973 to be statistically significant (and given the same degree of variation in mean value differences recorded in the current study), a sample of 65 homes would be required.

However, the mean change in value is more consistent when the *same* surveyor completed the pre-installation valuation and the post-installation one.

When different surveyors completed the pre-installation and post-installation valuations, there is a very wide confidence interval; the actual change in value is expected to be within the range of -£9,508 to £14,308, meaning that the actual change in value could be negative. On the other hand, when the same surveyor completed both valuations on a property, the change in valuations is much more consistent, so that the confidence interval is always positive, meaning that the uplift in this case is statistically significant (although it could be as little as a £437 increase in the mean value).

In summary, the confidence intervals for the different samples and the associated minimum and maximum values around those confidence intervals are as follows (noting that numbers may not add up due to rounding):

Table 1: mean uplift in property value pre and post EWI installation with confidence intervals

All properties (n=19)	+£2,973	+/-£5,836	-£2,860	+£8,808
Properties with pre and post EWI valuations done by different surveyors (n=10)	+£2,400	+/-£11,908	-£9,508	+£14,308
Properties with pre and post EWI valuations done by the same surveyor (n=9)	+£3,611	+/-£3,174	+£437	+£6,785

1.6. Does solid wall insulation generally add value to a property?

After the valuations had been completed, the surveyors were interviewed by telephone. Part of each interview involved discussion of the surveyors' awareness and perceptions of SWI, particularly EWI.

Most of the surveyors involved in the research claim to have had little or no former experience of valuing homes with any kind of solid wall insulation installed, including EWI. This is not surprising given that very few homes have had EWI installed.[1]

In the interviews, surveyors acknowledged some benefits of EWI, including the improvement of the energy efficiency of a property and associated reduction in energy costs, which they estimated to be around £200 per year. However, surveyors in this study considered the cost saving to be insufficient to have a major impact on property value.

The main perceived benefit of external wall insulation among the surveyors taking part in the research relates not to energy efficiency or costs savings, but that it improves the appearance of a run-down property, thus giving it greater 'kerbside appeal' and making it more likely that potential buyers will be attracted to the property.

Surveyors believe that the energy cost savings are slight and, indeed, BEIS modelling of the test properties indicate that the present value of expected energy cost savings for the properties in the test group are £134 per annum over a 36-year period.

In terms of general views on EWI, the installation of EWI is perceived by surveyors to be costly and disruptive (although this should not have an impact on valuations) and EWI is often associated by surveyors with local authority properties rather than with private dwellings. There is thought to be little demand for EWI among private householders, as it might 'spoil' the appearance and character of a home and *reduce* the value of a property. However, these are the perceptions of surveyors in this study and is based on limited actual experience of valuing homes with EWI installed.

Finally, there is a risk that surveyors often associate with EWI, that it can cause condensation and mould after installation (particularly if the work is not done to a high standard).

1.7. Can any uplift in property value be attributed to solid wall insulation?

Surveyors were asked to rate different features of the properties, before and after the installation of EWI, using a scale of 1 (poor) to 10 (excellent).

The only features with a difference of more than 0.1 between the pre-installation and post-installation valuations are:

- The external appearance of the building (an increase of 1.8)
- The condition of the property (an increase of 0.9)
- How well insulated the property is (an increase of 0.7)

This is supported by feedback from surveyors in the qualitative interviews that the key improvement to the properties is the external appearance, which improves the properties' 'kerbside appeal.'

[1] Household Energy Efficiency National Statistics estimates that 734,000 UK homes have SWI installed (the majority of which are EWI), which is approximately 9% of all 8.5m solid wall homes and less than 3% of all homes in the UK.

Statistical analysis determines that there is a correlation between the change in property value and the change in external appearance and condition of a property (and, to a lesser extent, the internal appearance).

On the other hand, there is little correlation between the change in property value (pre-installation to post-installation of EWI) and a change in the rating of the properties for how well insulated they are.[2]

Indeed, in the interviews, surveyors state that property condition and external appearance are particularly important factors in the valuation of a property, whereas it is less important how well insulated a property is (that feature being the least important stated factor in property valuation).

Also, in the qualitative interviews, most surveyors indicated that they noted an improvement in the external appearance of the properties following EWI installation and tended to base their valuations on this improvement rather than taking into account any energy efficient benefits (including energy cost savings, which they believed to be insufficient to have a major impact on their valuations).

1.8. Conclusions

A statistically significant uplift in property value can be demonstrated only if both the pre-EWI installation and post-EWI installation valuations are carried out by the same surveyor. Even then, the uplift may only be slight.

Any uplift demonstrated in this study is due to an improvement in the appearance of the property rather than any energy efficiency improvements or energy cost savings.

If the market (in this case in the form of surveyors) were behaving rationally, financial benefits worth approximately £8,000 would be taken into account by surveyors when valuing properties post-installation of EWI, comprising £5,000 from energy cost savings over a 36-year period[3] plus an uplift of £3,000 due mainly to an improvement in the appearance and condition of the property.

The average uplift recorded in the research was £3,000, considerably lower than the £8,000 that a rational market would have added to property value. This indicates that the market valuations do not capture all the value of EWI, which may prevent the market from behaving rationally.

The value of future energy savings for house buyers is unclear, as they are unlikely to remain in the house for the lifetime of the measure (36 years). Although they are likely to experience and benefit from only a fraction of total energy savings, if the market were to behave rationally the value of remaining future energy savings would be attributed to the property's resale value, which would allow house buyers to recoup the unrealised value of energy savings associated with EWI. However, surveyors report that they do *not* consider the effect of EWI on the property's running costs when valuing the property, which indicates that the market does not rationally value energy savings associated with EWI.

Even if the research findings are not statistically significant, that is mainly a result of the small-scale and exploratory nature of the pilot study. The process has been shown to be a practical and replicable method of testing the extent to which EWI can add value to a property.

[2] See section 7 of this report for more detail on the correlation analysis conducted on the research data.
[3] See (see https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government. Future energy savings are discounted to reflect consumers' preference for immediate benefits, in line with HM Treasury's Green Book guidance on economic appraisal).

However, a number of revisions and improvements to the research methodology would enhance the process.

- The sample (number of properties and number of surveyors) needs to be more robust than managed in the current project, probably a minimum of 65 properties.
- Consideration should also be given to having the same surveyor conduct both the pre-installation and post-installation valuations, in order to minimise the variable that is the subjective view of the surveyor.[4]
- Sufficient lead time is needed to book surveyors and for them to produce their written reports and valuations.
- It should be assumed that the installation process will take longer than originally specified, and that the schedule will undergo revisions during the installation period.
- Tenants should be recruited in-person (to build rapport) and suitably incentivised.

The methodology might also benefit from the inclusion of interviews with tenants.

It is also important to note that the current study addressed only local authority properties of a specific type in a specific area. It is not possible to extrapolate findings to cover other types of property (such as larger or more expensive properties, privately-owned properties or properties in other locations).

If these recommendations are followed, we believe that there is merit in applying the research methodology to the installation of EWI in a larger and more diverse sample of properties, and also to determining whether other energy efficiency measures add value to a property.

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In the rest of this document we discuss the above findings and implications in more detail.

[4] Due to concerns over a possible Hawthorne Effect, (the tendency, particularly in research and social experiments, for people to modify their behaviour because they know they are being studied, and so to distort, possibly unwittingly, the research findings), a decision was made to have the pre and post EWI installation valuations carried out by different surveyors in half of cases. In the remaining cases the same surveyor carried out both valuations on a property. However, when different surveyors carried out the pre and post installation valuations, there was more variance in the data. However, having the same surveyor do pre and post installation valuations could introduce an anchoring bias, by which surveyors could be influenced by their initial valuation and observation that work has been done. On balance our view is that having the same surveyor carry out both valuations yields data that is more robust, as it eliminates variation based on the personal judgement of the surveyor.

2. THE RESEARCH PROGRAMME

2.1. Background and project objectives

This report summarises the key findings and implications of a research project conducted by Purple Market Research (www.purplemr.co.uk) for the Department of Business, Energy and Industrial Strategy (BEIS) in 2018.

It is widely accepted that in order to meet targets for the reduction in emissions and energy usage it is necessary to have the majority of UK homes properly insulated to a high standard. New housing is built in line with the latest building regulations, which require properties to be much more energy efficient than most existing buildings. A key focus for further reductions in emissions, therefore, is the retrofitting of insulation to the *existing* housing stock. Insulation is a proven way of reducing CO_2 emissions and has played a crucial role in energy savings.

A programme of cavity wall insulation has helped to address the energy efficiency of newer properties. However, many older properties do not have cavities (and usually have solid walls). Solid wall insulation (SWI) can be applied to the inside or outside of property walls to achieve energy efficiencies, but most solid wall homes do not currently have wall insulation.

Although there are demonstrable energy efficiency and cost saving benefits of installing external and internal solid wall insulation, there is little, if any, evidence of an uplift in the value of properties with SWI installed. Various organisations, including the Energy Saving Trust and DECC (in the 2013 report 'An Investigation of the Effect of EPC Ratings on House Prices' referenced in the BEIS research briefing document), have shown that there is a value uplift in properties with a better EPC rating, compared with those with a worse one. They have, however, not shown a value uplift for specific energy efficiency measures.

BEIS commissioned research to determine the impact of installing external wall insulation (EWI) on the value of domestic properties through research among surveyors, in the form of qualitative interviews and actual valuations of homes that have had EWI installed.

The effect of such insulation on property value needs investigating as there is significant untapped potential in the housing market for this measure. This study aims to determine whether the significant energy savings associated with EWI are likely to lead to an expected rise in a property's market valuation.

The primary aim of the project was therefore to determine if EWI can be shown to add value to a property when installed.

This aim was met through the valuation of properties before and after EWI was installed.

Within the research project, the main questions addressed were:

- How important is EWI installation (and other factors) when valuing a property generally?
- Has there been any uplift in the value of properties with EWI installed pre and post installation?
- Does SWI / EWI generally add value to a property?
- Can any uplift in property value be attributed to EWI installation?

A secondary project aim was to pilot a research methodology to determine whether it can be rolled out (as it is or in a modified form) to assess a larger number of homes or to determine if other energy efficiency measures increase the value of a property. If modifications or improvements to the methodology are required, a supplementary objective was to make recommendations on those revisions.

2.2. The research methodology

BEIS commissioned Purple Market Research to conduct a research exercise to determine if the installation of solid wall insulation adds value to a property.

In order to meet the project aims, Purple liaised with the SWI installer, residents in the relevant properties and surveyors to carry out valuations of properties in the Birmingham area before and after the installation of EWI.

The valuation reports and interviews conducted with the surveyors were analysed by Purple to establish if the installation of SWI can be shown to add value to a property.

The project also acts as a road test for the methodology, which has the potential thereafter of being rolled out to larger scale projects to determine the impact on property value of other energy efficiency measures.

More detail on the research process can be found in the following section of this report.

3. THE PROCESS

3.1. The properties

The research project focused on properties located within a residential estate of local authority homes under the ownership and management of Birmingham City Council and situated to the East of Birmingham. The properties are post-war, dating from 1950 to 1955.

The properties are of a non-standard concrete construction known as Wimpey No Fines.[5] The properties were built with a brick plinth and concrete walls of solid construction (hence their suitability for EWI).

These homes are not typical of UK homes with solid wall construction: the homes in this study were built in the 1950s whereas most solid wall homes were built before 1940. Also, local authority homes are less likely than private homes to be traded in the housing market. However, private homes with EWI installed are scarce and unlikely to be geographically clustered. Birmingham City Council's plan to install EWI in 45 homes in the area therefore provided a good test group, allowing us to conduct research among multiple properties of a similar type (see below) in a defined area.

Of the 45 homes with EWI installed, 21 (just under half) were included in the research project. In addition, five control homes in the area were selected; these did not have EWI installed, but were valued at the start and end of the fieldwork period to determine if the property market in this area had changed during that period (a topic that was also covered in qualitative interviews with surveyors).

The homes included in the research are a mix of end-terraced houses, mid-terraced houses and maisonettes.

Table 2: property types included in the research

Semi-detached / end terraced	6	3
Mid-terraced	6	2
Maisonettes	9	0
Total	**21**	**5**

The post-installation valuation could not be conducted in two of these homes, due to the circumstances of the residents. Thus 19 homes were valued pre and post EWI installation.

While this is not a large sample, it is sufficient for a pilot study. A more extensive study would need to address the difficulty of finding clusters of properties having EWI installed (discussed above). Also, the limited research budget restricted the scale of the project.

[5] Wimpey No Fines was a design for the mass production of social housing.

Before the installation of solid wall insulation, surveyors noted that the properties were generally in a poor condition. Most did not appear to have had any refurbishment work done on them for some time and surveyors observed that the external appearance of most properties pre-EWI installation was tired and unkept.

Figure 1: Properties before installation of EWI

The poor condition and appearance of the properties meant that they benefitted from the improvement in appearance provided by EWI.

3.2. Property valuation

Properties were valued by a mix of RICS Registered Valuers[6] and surveyors who are members of RICS, all based within a 5-mile radius of the area selected for research. All valuations (by RICS Registered Valuers and other RICS members) were done in accordance with the RICS Valuation – Global Standards 2017 (the 'Red Book').

Market value, as specified by RICS, was defined as the estimated amount for which an asset should exchange on the valuation date between a willing buyer and willing seller in an arm's length transaction after proper marketing where the parties had each acted knowledgeably, prudently and without compulsion.

[6] RICS Valuer Registration is the international mark of valuation expertise. It is open to all qualified RICS members undertaking valuations under the RICS Valuation Professional Standards (the 'Red Book'). All members who have registered and been accepted as meeting the standards set out for Valuer Registration are entitled to call themselves an RICS Registered Valuer and use the accreditation logo.

3.3. External wall insulation

Solid wall insulation (SWI), in the form of external wall insulation (EWI), was installed in the test homes. The homes had Rockwool insulation fitted to the outside of the walls followed by a base coat render. Pipework and other external fittings were taken off the properties and refixed after the installation of EWI.

Figure 2: Properties before and after installation of EWI

Most surveyors observed that the external appearance of the properties was considerably improved by the installation of EWI, although in a few cases it was observed that the quality of workmanship was poor.

3.4. Energy and cost savings from EWI

The Energy Saving Trust estimates that the cost saving resulting from the installation of solid wall insulation (the EST does not distinguish between external and internal wall insulation) in a gas-heated home (and based on fuel prices as of April 2018) is between £115 and £245 per annum, depending on the property type.

Table 3: EST estimates of energy cost savings from installation of SWI[7]

Semi-detached / end terrace	1,090 kg	£245
Mid-terrace	670 kg	£155
Maisonettes / flats	510 kg	£115

The EST estimates are typical of the estimated savings currently in the public domain that surveyors would have access to.

BEIS has modelled the predicted present value of energy savings associated with EWI for the test group of properties in the current research. The modelled average annual cost savings in the analysis are between £92 and £193, depending on property type. This includes comfort taking.

Table 4: BEIS modelled energy cost savings from installation of SWI[8]

Semi-detached	£6,633	£184
End terrace	£6,941	£193
Mid-terrace	£4,433	£123
Converted flat	£3,320	£92
Total weighted average	**£4,810**	**£134**

[7] Energy Saving Trust 2018

[8] The energy savings are modelled in the National Housing Model, which models the impact of energy efficiency measures in properties of different types and sizes. The energy savings in the NHM are based on SAP, a physics-based methodology using assumptions on heating patterns and temperatures, but are adjusted using in-use factors that are derived from the National Energy Efficiency Data-framework (NEED). NEED provides the evidence of actual savings from insulation measures compared to SAP's theoretical savings.

The ‘total’ modelled saving of £134 per annum is the weighted average of the dwelling types and sizes (number of bedrooms) in the test group.

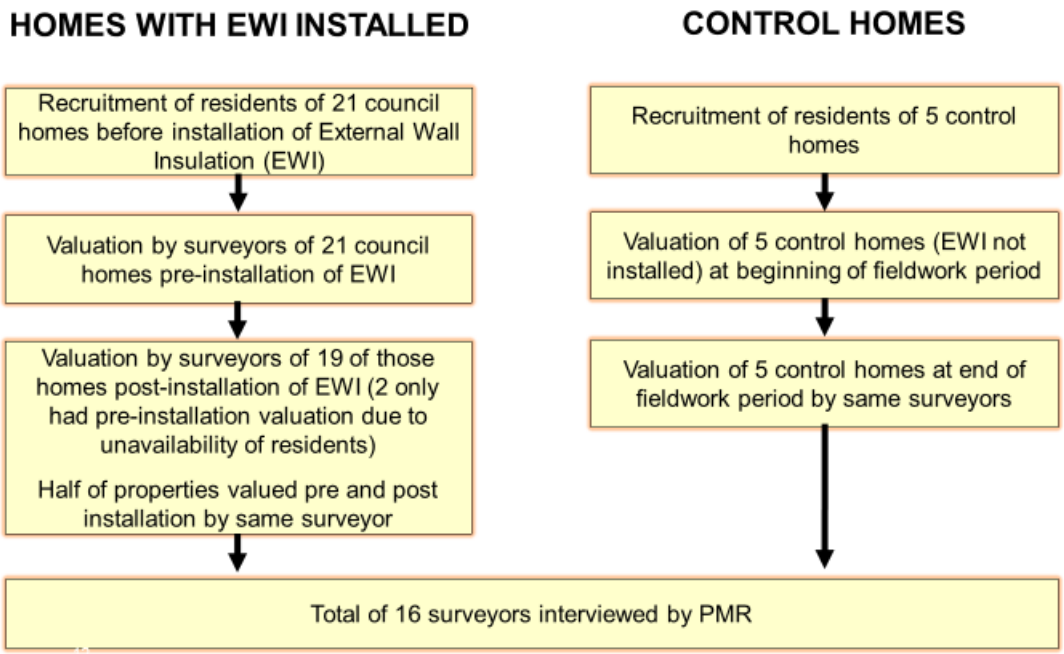
The savings in the BEIS analysis are based on observed energy use before and after EWI has been installed in other homes after comfort taking, meaning that there is additional value to residents in the form of improved comfort.

In the BEIS modelled data, the present value of future energy cost savings over a 36-year period in the test homes are likely to be almost £5,000 (around 4%-5% of the average property value). There is therefore a case to be made that a property with EWI installed should have a valuation that is higher than one without EWI.

3.5. Project structure and management

The methodology employed in the research project is summarised in the following chart.

Figure 3: Research methodology



Of the 45 homes to have EWI installed, the residents of 21 agreed to have their homes valued before and after the installation was carried out. Residents were initially contacted by mail. Thereafter residents were visited at their homes and asked to take part in the research by allowing their homes to be valued at the start and end of the process. An incentive to the value of £20 was offered for each of the pre and post installation valuations.

Surveyors were commissioned to carry out valuations before EWI was installed, and then again after the installation had been completed. Surveyors had to be RICS qualified and be located in close proximity to the test homes (a requirement of the RICS qualification process).

Due to concerns over the potential Hawthorne Effect[9] and anchoring bias[10], a decision was made to have half of the pre and post EWI installation valuations carried out by different surveyors, while in the other half of cases the same surveyor carried out both valuations on a property.

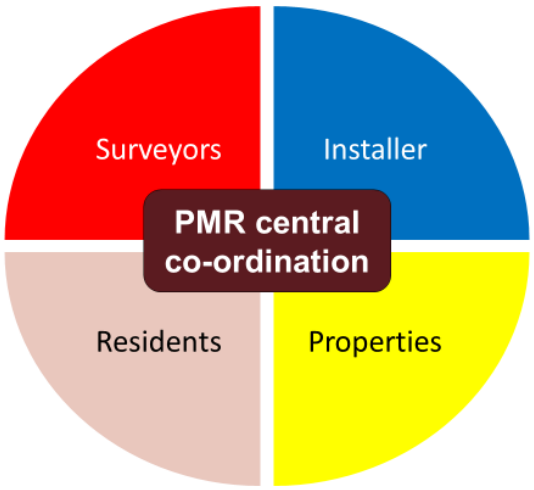
Neither approach is perfect. While having different surveyors carry out the pre and post installation valuations negates any possible Hawthorne Effect, it introduces a subjective element to the valuations. Although valuations are objective in that they are based on set criteria (as already discussed), in the in-depth interviews surveyors commented that there tends to be an element of personal judgement when valuations are done, so that there tends to be greater variation in the pre and post installation valuations when carried out by different surveyors. Also, most surveyors commented (when interviewed at the end of the process) that they were aware that they were taking part in a research exercise, despite not having been explicitly told that this was the case).

Five control homes in the area were valued by surveyors at the start and end of the fieldwork period to determine if there had been any movement in the property market.

In total, 16 surveyors were commissioned to carry out valuations. At the end of the process, interviews were conducted with all these surveyors to explore their perceptions of SWI, the rationale for their valuations, and their rating of the properties before and after installation for a number of different features.

A key challenge associated with the project methodology was co-ordinating the different parties involved in the process.

Figure 4: Liaising with key parties in the research



[9] The Hawthorne Effect is the tendency, particularly in research and social experiments, for people to modify their behaviour because they know they are being studied, and so to distort (possibly unwittingly) the research findings. In this case, the concern was that valuing a house twice as part of a research project might induce them to raise their valuation as they anticipate an increase in property value, despite not necessarily picking up on the value given by the installation of EWI.

[10] Whereby surveyors base their valuation on their previous valuation of the same property, rather than on a fresh assessment. If there had been a noticeable change since the previous valuation, as in the test group homes, the second valuation may be greater than if the surveyor were to value the property without having previously valued it.

In more detail, the issues were as follows.

The properties

The properties selected for the research project are local authority owned and surveyors observed in their reports and in the qualitative interviews that most properties were in poor condition. The value of homes in this area tended to be lower than in surrounding areas. As location is a key factor in valuations, the undesirability of the area introduces a ceiling value for properties in the area.

The contractor

E.ON was the main installing contractor working on behalf of Birmingham City Council.

The installation plan underwent many revisions during the project, due to factors such as the late arrival of materials, householder engagement issues, a clash with the summer holiday period and weather conditions.

These challenges required regular communication with the site manager and flexible project management throughout the project.

Residents

The recruitment process was challenging at times, because residents were not always receptive to mail, telephone calls or email. A more effective process was to have an interviewer knocking on doors and recruiting face to face. It was necessary, thereafter, to keep in regular contact with residents (usually by telephone, as many did not have email) as the installation schedule, and therefore the surveyor visits, often needed to be rescheduled (as indicated above).

Two of the homes could not be valued post-installation, due to the unavailability of the residents.

There was also some difficulty obtaining tenant contact information from the local authority, mainly due to data protection and GDPR issues.

Surveyors

Surveyors were asked to carry out valuations on the home as they would normally do, but assuming the properties were ‘freehold on an unencumbered basis,’ meaning that properties were to be considered freehold, irrespective of property type, were empty, had no debt attached and were being offered for sale on the open market. Surveyors were not told the objective of the project (to determine if EWI adds value to a property). However, in the depth interviews, at which stage we discussed the project aims more explicitly (notably whether EWI added value to properties), most surveyors told us that they had been able to work out the aim of the exercise.

The schedule of surveyors’ visits to carry out valuations also needed to be flexible and to accommodate the delays and revisions to the installation plan. Surveyor visits also had to be co-ordinated with the residents’ availability.

Another challenge relating to surveyors was the limited number within the small target geographical area. RICS-registered valuers were prioritised, although again there were even more limited numbers close enough to the target area.

Surveyors were busy and often unavailable at short notice, which again had an effect on the project scheduling.

Effect on the project

The whole process took four times as long as originally envisaged, and ultimately took over four months to complete.

The requirement for flexibility in the research process is a learning that has implications for any future rolling out of the research methodology.

3.6. Research based on multiple sources of data

The key research questions required reference to several different, albeit complementary, sources of data. The key primary information sources are the surveyor valuation reports and telephone interviews conducted with surveyors at the end of the process. In addition, statistical analysis has been conducted to determine how robust the research findings are.

In summary, each of the main research questions has been addressed as follows.

Table 5: Key research questions and how they have been addressed

Has there been any change in property value in the area?	Calculation of mean valuation of 5 control homes at start and end of fieldwork period Qualitative feedback from surveyors on the property market
How important is EWI installation (and other factors) when valuing a property generally?	Stated importance rating given by surveyors to EWI installation and other factors
Has there been any uplift in the value of properties with EWI installed pre and post installation?	Calculation of mean valuation pre and post EWI installation Statistical analysis of changes in value to determine whether significant
Does SWI / EWI generally add value to a property?	Analysis of main themes of qualitative interviews with surveyors
Can any uplift in property value be attributed to EWI installation?	Pearson correlation analysis to determine any link between change in value and change in rating of property features (including how well insulated) pre and post EWI installation Analysis of main themes of qualitative interviews with surveyors

In the following sections of this report, each of the key questions is addressed.

4. HAS THERE BEEN ANY MOVEMENT IN THE LOCAL HOUSING MARKET?

It was important to check whether any changes in property valuations over the fieldwork period (April to September 2018) were due to movement in the local housing market, so that any movement could be factored into the analysis of property valuations.

To check whether this was an issue, five control homes were valued at the start and end of the fieldwork period. Five surveyors were commissioned to carry out the valuations, with each surveyor valuing a property twice.

At the beginning of the fieldwork period, the mean valuation given to the control homes was £127,500. At the end of the fieldwork period, the mean was £127,700.

Thus, a small mean uplift of £200 on the mean property value of the control homes was recorded, equivalent to an increase in value of 0.2%.

Figure 5: Mean property value of control homes at start and end of fieldwork period

Table 6 overleaf shows the valuations of each of the control properties at the start and end of the fieldwork period.

Only one property demonstrated an increase in property value, the uplift being £1,000 (less than one per cent).

Table 6: Property valuations of control homes at the start and end of the fieldwork period

Type of property	No. of bed-rooms	Valuation at start of fieldwork period	Valuation at end of fieldwork period	Change in valuation	% change
End of terrace	3	£150,000	£150,000	£0	0
Semi-detached	2	£130,000	£131,000	£1,000	0.8
Mid terraced	3	£122,500	£122,500	£0	0
Mid terraced	2	£125,000	£125,000	£0	0
End of terrace	2	£110,000	£110,000	£0	0
Mean		**£127,500**	**£127,700**	**£200**	0.2

The increase in property value for the one property in the control sample was attributable to other work done to the property in the period to improve the external appearance and did not reflect any market movement.

The lack of demonstrable change in the property market is clearly based on a small sample. However, there is supporting evidence to consolidate that finding. In the qualitative interviews, surveyors (both those valuing the control homes and those valuing other homes) were asked about the local housing market and they confirmed that there had been no movement in the market during this period.

It is therefore safe to conclude that the research does not need to factor in any changes in the local property market.

5. IS THERE AN UPLIFT IN PROPERTY VALUE FOLLOWING EWI INSTALLATION?

5.1. Mean valuations of properties before and after installation

The mean property value across the 19 properties increased after the installation of EWI. The mean property value was £93,895 prior to EWI installation. Following installation, the mean value increased by £2,973 to £96,868, an uplift of 3%.

There was no other work done on the properties apart from the installation of EWI and render, and any making good required. So, the uplift can be attributed to the installation of EWI (mainly the resulting improvement in the appearance of the property).

Figure 6: Uplift in mean property value pre and post installation of EWI

Base: all homes with EWI installed (n=19)

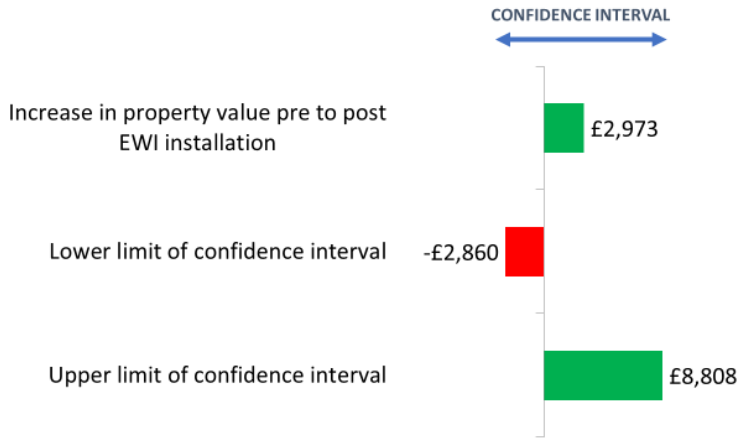
There is a statistical margin of error associated with the change in value between the pre and post installation of EWI, in the form of a confidence interval[11]. The confidence interval in this case indicates that the actual mean change in property value before and after the installation of EWI is a positive £2,973 +/- £5,836.

That means that the change could be as high as £8,808 (a 9% increase), but it could also be a decrease in value of £2,860 (a drop of 3% in value).

That analysis is summarised in Figure 7.

[11] The analysis on the pre-post shifts has been done using paired sample T-tests. T-statistics are estimated by dividing the mean difference by the standard error of the difference. Significance probabilities are based on a normal distribution with n-1 degrees of freedom (where n is the number of cases).

Figure 7: Difference in mean property value pre and post EWI installation and confidence interval (based on total sample)



Base: all homes EWI installed (n=19)

Thus, the confidence interval (the range within which the actual value could be, given that our mean valuation is based on a small sample of properties) is plus or minus £5,834. Therefore, the actual change in property value before and after the installation of EWI could be as much as £8,808 (a 9% increase), but it could also be a decrease in value of £2,860 (a drop of 3% in value).

We can therefore conclude that the uplift in value is *not* statistically significant. That the uplift did not reach statistical significance is not surprising, given that the data is based on a small sample of 19 homes. Indeed, in a new survey, for a mean increase in value of £2,973 to be statistically significant (and given the same degree of variation in mean value differences recorded in the current study), a sample of 65 homes would be required.

5.2. Differences if same or different surveyor did the pre and post EWI installation valuations

One of the reasons that the mean change in property valuation from pre-installation to post-installation is not statistically significant is that there may be a subjective element in property valuation.

In 13 of the 19 properties where both pre-installation and post-installation valuations were done, an increase in the property value is recorded. In two cases the valuation increased by more than 25% (one by 29% and one by 32%). In these cases, a different surveyor carried out the pre-installation and post-installation valuations. In the in-depth interviews surveyors indicated that there is an element of personal judgement in valuations, so that two surveyors may give different valuations to a single property.

On the other hand, in three cases the value of the property *decreased* post-installation of EWI. This can also be partly attributed to an element of subjectivity in the valuations, although a perceived poor quality of workmanship in the EWI installation was another key factor.

In three cases there is no change in the valuation pre to post-EWI installation.

The valuations for each property are shown in the following table, which is ranked by the percentage change in property value from the pre-EWI installation to post-EWI installation.

Table 7: Actual valuations given for properties pre and post EWI installation (ranked by percentage change in value from pre-installation to post-installation)

Type of property	No. of bed-rooms	Pre and post EWI valuations done by same surveyor or not	Pre-EWI installation valuation	Post-EWI installation valuation	Change in valuation	% change
Maisonette	1	Different	£65,000	£86,000	£21,000	32
Semi detached	2	Different	£120,000	£155,000	£35,000	29
Mid-terraced	3	Same	£110,000	£122,000	£12,000	11
Maisonette	1	Different	£60,000	£65,000	£5,000	8
End of terrace	2	Same	£90,000	£97,500	£7,500	8
Maisonette	1	Same	£67,500	£72,500	£5,000	7
Mid-terraced	3	Different	£118,000	£125,000	£7,000	6
Mid terraced	3	Same	£125,000	£130,000	£5,000	4
Mid terraced	3	Different	£118,000	£121,000	£3,000	3
End of terrace	2	Same	£85,000	£86,500	£1,500	2
End of terrace	2	Different	£115,000	£116,000	£1,000	1
Maisonette	1	Same	£75,000	£76,000	£1,000	1
Maisonette	1	Same	£57,500	£58,000	£500	1
Maisonette	1	Same	£70,000	£70,000	£0	0
Semi detached	2	Same	£115,000	£115,000	£0	0
Mid terraced	2	Different	£115,000	£115,000	£0	0
Maisonette	1	Different	£87,500	£75,000	-£12,500	-14
End of terrace	2	Different	£105,000	£90,000	-£15,000	-14
Maisonette	1	Different	£85,500	£65,000	-£20,500	-24
Mean			**£93,895**	**£96,868**	**£3,611**	3

In the qualitative interviews with surveyors, it is clear that the installation of EWI does not always result in an increase to the property value. In some cases, EWI is thought to add no value to the property, or even to devalue it. The rationale for this judgement is generally that the work has not been done to a high standard or that EWI is likely to cause problems in future, such as condensation and damp.

When the pre-installation and post-installation valuations are done by different surveyors, an additional factor, as noted above, is the subjective view of the surveyor. Generally, surveyors acknowledged in the interviews that their valuations come with a margin of error, typically estimated at plus or minus 10%.

The mean change in value is more consistent when the *same* surveyor completed the pre-installation valuation and the post-installation one. Properties where pre-installation and post-installation valuations were done by different surveyors tend to appear at the top and bottom of the above table, indicating that the differences in the pre and post installation valuations are greatest in those cases.

When the same surveyor did the pre-EWI installation and post-installation evaluations, all but two properties were given a higher valuation after the installation.

Table 8: Property valuations given when the same surveyor carries out the pre and post EWI installation valuation (ranked by percentage change in value from pre-installation to post-installation)

Type of property	No. of bed-rooms	Pre and post EWI valuations done by same surveyor or not	Pre-EWI installation valuation	Post-EWI installation valuation	Change in valuation	% change
Mid-terraced	3	Same	£110,000	£122,000	£12,000	11
End of terrace	2	Same	£90,000	£97,500	£7,500	8
Maisonette	1	Same	£67,500	£72,500	£5,000	7
Mid terraced	3	Same	£125,000	£130,000	£5,000	4
End of terrace	2	Same	£85,000	£86,500	£1,500	2
Maisonette	1	Same	£75,000	£76,000	£1,000	1
Maisonette	1	Same	£57,500	£58,000	£500	1
Maisonette	1	Same	£70,000	£70,000	£0	0
Semi detached	2	Same	£115,000	£115,000	£0	0
Mean			**£88,333**	**£91,944**	**£2,973**	3

Two properties demonstrated no increase in value following the installation of EWI. The uplift was between 1% and 11% in all other cases.

However, as table 9 overleaf indicates, when *different* surveyors carried out the pre-installation and post-installation valuations, the change in valuation is considerably more polarised than if the same surveyor carried out both valuations on a property.

Table 9: Property valuations given when <u>different</u> surveyors carry out the pre and post EWI installation valuation (ranked by percentage change in value from pre-installation to post-installation)

Type of property	No. of bed-rooms	Pre and post EWI valuations done by same surveyor or not	Pre-EWI installation valuation	Post-EWI installation valuation	Change in valuation	% change
Maisonette	1	Different	£65,000	£86,000	£21,000	32
Semi detached	2	Different	£120,000	£155,000	£35,000	29
Maisonette	1	Different	£60,000	£65,000	£5,000	8
Mid-terraced	3	Different	£118,000	£125,000	£7,000	6
Mid terraced	3	Different	£118,000	£121,000	£3,000	3
End of terrace	2	Different	£115,000	£116,000	£1,000	1
Mid terraced	2	Different	£115,000	£115,000	£0	0
Maisonette	1	Different	£87,500	£75,000	-£12,500	-14
End of terrace	2	Different	£105,000	£90,000	-£15,000	-14
Maisonette	1	Different	£85,500	£65,000	-£20,500	-24
Mean			**£98,900**	**£101,300**	**£2,400**	3

When different surveyors carried out the pre-installation and post-installation valuations, the mean shift in value was a positive £2,400.

That uplift is close to the mean difference given when the same surveyor carries out both pre-installation and post-installation valuations (£2,973), but the mean difference hides a much greater variation in the change of valuation for individual properties when different surveyors are involved.

- When different surveyors are involved, in two cases the uplift in valuation is more than 25%.
- At the other extreme, in three cases the property value *falls* between the pre-installation and post-installation valuations (by between 14% and 24%).

In the in-depth interviews, the main explanation given for the wider variance of valuations when different surveyors valued the same property was the subjective element of valuing. Also, where a decrease in the valuation was recorded, another key reason given was the quality of the work, with surveyors in this case believing that there was a risk of condensation and mould in future, resulting from the poor quality of the installation of EWI.

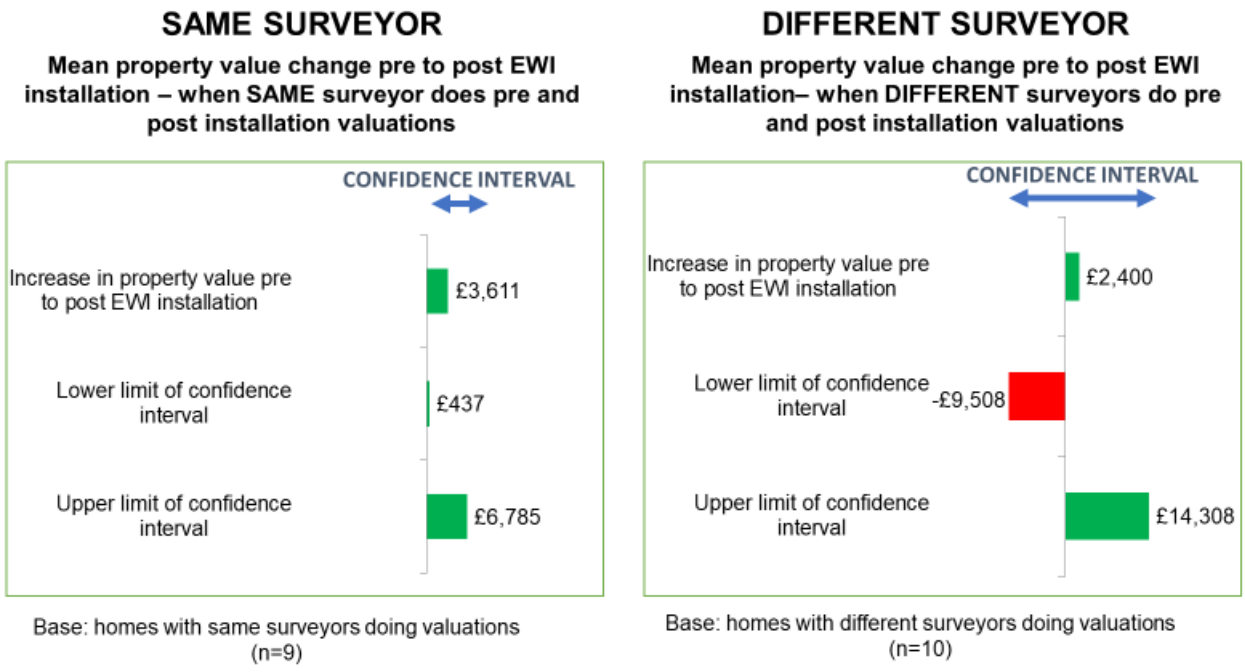
The following table and chart summarise the confidence intervals when the same surveyor carries out both valuations on a property and when two different surveyors carry out the pre-installation and post-installation valuations. They also show the associated minimum and maximum values around those confidence intervals (noting that numbers may not add up due to rounding).

Table 10: mean uplift in property value pre and post EWI installation with confidence intervals (comparing when same surveyor conducted both pre and post installation valuations and when different surveyors did pre and post installation valuations)

All properties (n=19)	+£2,973	+/-£5,836	-£2,860	+£8,808
Properties with pre and post EWI valuations done by different surveyors (n=10)	+£2,400	+/-£11,908	-£9,508	+£14,308
Properties with pre and post EWI valuations done by the same surveyor (n=9)	+£3,611	+/-£3,174	+£437	+£6,785

The differences are clearly illustrated in the following chart.

Figure 8: Difference in mean property value pre and post EWI installation and confidence interval



When different surveyors completed the pre-installation and post-installation valuations, there is a very wide confidence interval. The actual change in value is expected to lie within the range of -£9,508 to £14,308 (or a percentage change of -9.5% to +14.5%, respectively), meaning that this change may be negative.

When the *same* surveyor completed both valuations on a property, the change in valuations is much more consistent, so that the confidence interval is always positive, so that the uplift in this case is statistically significant (with the actual change in value expected to be within £437 to £6,785, or a percentage change of 0.5% to 7.5%, respectively).

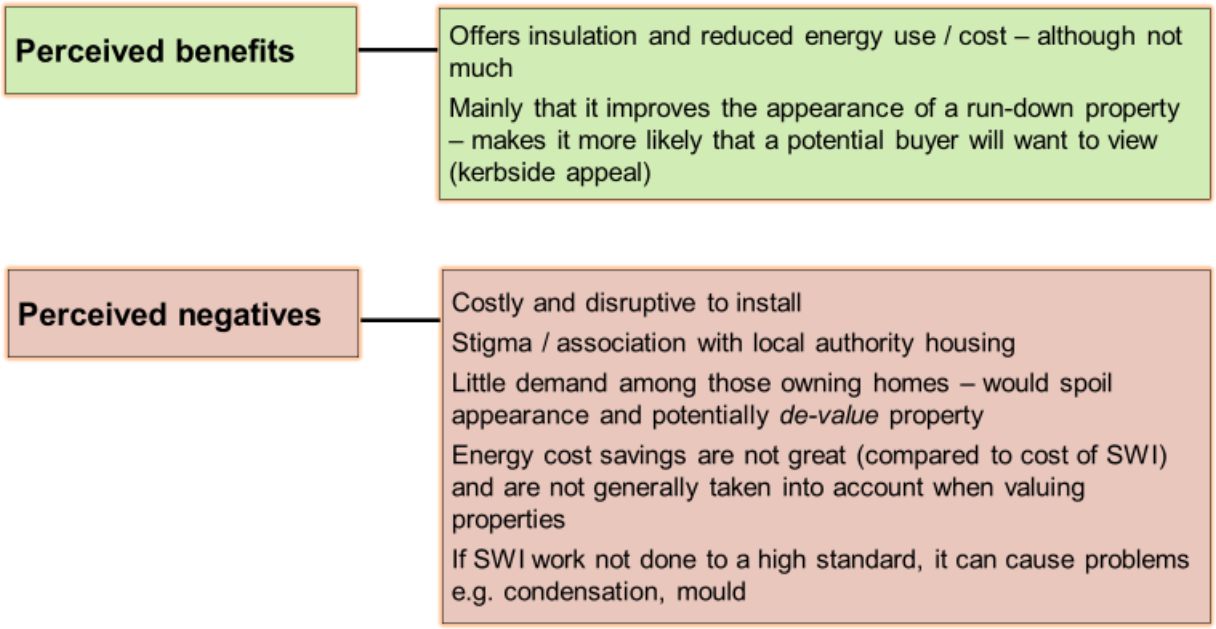
6. DOES SOLID WALL INSULATION GENERALLY ADD VALUE TO A PROPERTY?

In the qualitative interviews, surveyors discussed their experience and perceptions of SWI, in particular EWI, apart from in the current project. The qualitative interviews with surveyors have been analysed to draw out the main themes, and a number of issues have emerged. Findings from the surveyor interviews are not statistically significant and are indicative rather than definitive.

Of the 16 surveyors participating in this project, only around one in four claimed to have had experience of valuing homes that have EWI.[12] This is not surprising, given how few homes have actually had EWI installed.

The following positive and negative perceptions are those most likely to be mentioned by surveyors.

Figure 9: Surveyors' perceptions of SWI / EWI



In more detail, the main themes emerging from the interviews are as follows, together with illustrative quotations from surveyors.

[12] It should also be noted that surveyors often talked about 'solid wall insulation' or 'SWI' rather than external wall insulation (or EWI) although discussion generally related to EWI. We have left the comments as they were made.

The main perceived benefit of external wall insulation relates not to energy efficiency or costs savings, but that it improves the appearance of a run-down property, thus giving it greater 'kerbside appeal' and making it more likely that potential buyers will be attracted to the property.

> "*There is not much value uplift from SWI other than a bit for improving appearance*."
>
> *"You can't underestimate the impact of SWI on improving kerbside appeal. The old saying that you only have a second to make a first impression is very true in property purchasing. That initial feeling can make or break a deal."*
>
> *"EWI makes the property look nicer."*
>
> *"SWI does improve the appearance of a property, which is a massive plus."*

Another perceived benefit of EWI was an increase on comfort levels, although only a small number of surveyors mentioned this.

> *"I'm a big fan of SWI – it makes a home warmer."*
>
> *"I spoke to the tenant at length, she was delighted with the work since it turned a very cold environment into a nice warm home. If a prospective buyer of her property spoke to her and heard her story, I think they would be prepared to pay more."*

Some surveyors commented that they associate EWI with energy efficiency benefits and a resulting reduction in energy costs. However, the majority of surveyors believe that the energy cost savings are small and are generally estimated by surveyors to be around £200 per year, including comfort taking. This is consistent with the Energy Saving Trust estimates.

> "*I don't really think about the energy cost savings from SWI because they are minimal and not something potential purchasers will care about*."
>
> "*The saving on energy costs are not great, maybe a few pounds a week*."

Many surveyors believe that solid wall insulation does not have the same impact on the appeal, and therefore the value, of a property as, for example, a new kitchen or bathroom.

> "*A valuation is all about determining what people will pay for a property and in my experience a new kitchen or bathroom adds far more value than solid wall insulation could ever do*."

Although not directly relevant to the current project, surveyors also commented on the cost and disruption associated with EWI. EWI is thought by surveyors to be costly, estimated at upwards of £5,000 for this type and size of property (and much more for one-off installations of private dwellings), so that the payback period is likely to be in excess of 20 years.

The cost savings are perceived by surveyors to be slight and tend not to be taken into account when valuing a property post-installation of EWI. This is evidence that the market is not acting rationally. Once it is installed, EWI does provide energy cost savings. Any cost savings, even if they are slight in the short term, should be reflected in property value, rather than being dismissed, as is the case here. Furthermore, the value of any expected future energy savings at the point of resale would be captured by the property's resale value, if the market were to rationally value the energy savings associated with EWI.

Although the opportunity cost of installing EWI is high relative to other investments, such as internal refurbishments, in a rational market the transaction value of a property would be expected to capture differences in running costs between otherwise similar properties.

Some other negative perceptions relating to EWI (or SWI in general) were demonstrated by surveyors in the research.

> "*There are not many people who would be prepared to go through all the upheaval and cost of SWI for such little savings.*"

EWI tends to be associated by surveyors with local authority properties and not with private dwellings, with an associated stigma.

> "*SWI is still the preserve of local authorities. They have the negotiating power to bring the price down because they can do the work in batches. And they do it because it's often cheaper than other measures. People have access to all sorts of information online these days and so private homeowners read about these horror stories and even if they were considering SWI often get put off by this.*"
>
> "*You mainly see SWI on local authority and housing association homes. There is therefore a stigma attached to cladding*."

Consequently, there is thought to be little demand for EWI among private householders, as it may 'spoil' the appearance and character of a home and *reduce* the value of a property.

> "*We've talked a lot about what SWI could potentially add to the value of a property, however you also need to consider that if SWI is applied to a nice-looking property or is done badly it can actually devalue a property. I had to give this news to an elderly homeowner in a grand period home a couple of years ago and they were devastated to hear this news. They did it with all good intentions to improve warmth but unfortunately they were badly advised.*"
>
> "*External wall insulation only really improves the appearance of a low-value, run down property. That is not necessarily the case for better properties, when the insulation may not improve the appearance*."

Finally, there is a risk surveyors associate with EWI, that (particularly if the work is not done to a high standard) it can cause condensation and mould.

> "*In my experience SWI projects are often done to a relatively poor standard and can cause many long-term problems such as condensation and black mould*."
>
> "*There are problems if external wall insulation is not done well. In 10-15 years you can get water ingress between the wall and the insulation*."

With few exceptions, surveyors' perceptions of EWI tend to be either neutral or negative, and there is currently only limited evidence that EWI is valued by surveyors or likely to add value to a property except due to aesthetic benefits. Furthermore, any evidence suggesting that EWI *does* add value to a property relates to social housing and should not be extrapolated to the rest of the housing stock.

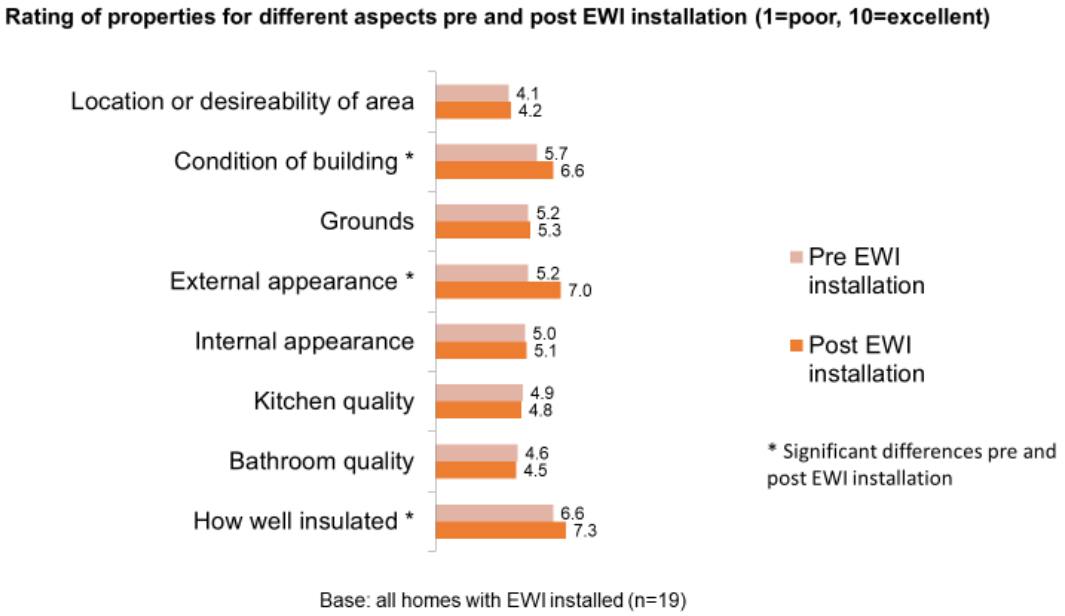
7. CAN AN UPLIFT IN PROPERTY VALUE BE ATTRIBUTED TO SOLID WALL INSULATION?

7.1. Rating of property features pre and post EWI installation

Surveyors were asked to rate different features of the properties, before and after the installation of EWI, using a scale of 1 (poor) to 10 (excellent).

The mean ratings given for each feature, pre-installation of EWI and post installation, are shown in figure 10 below.

Figure 10: Change in mean ratings given to properties pre and post EWI installation



The only features with a difference of more than 0.1 between the pre-installation and post-installation valuations are:

- The external appearance of the building (and increase of 1.8)
- The condition of the property (and increase of 0.9)
- How well insulated the property is (an increase of 0.7)

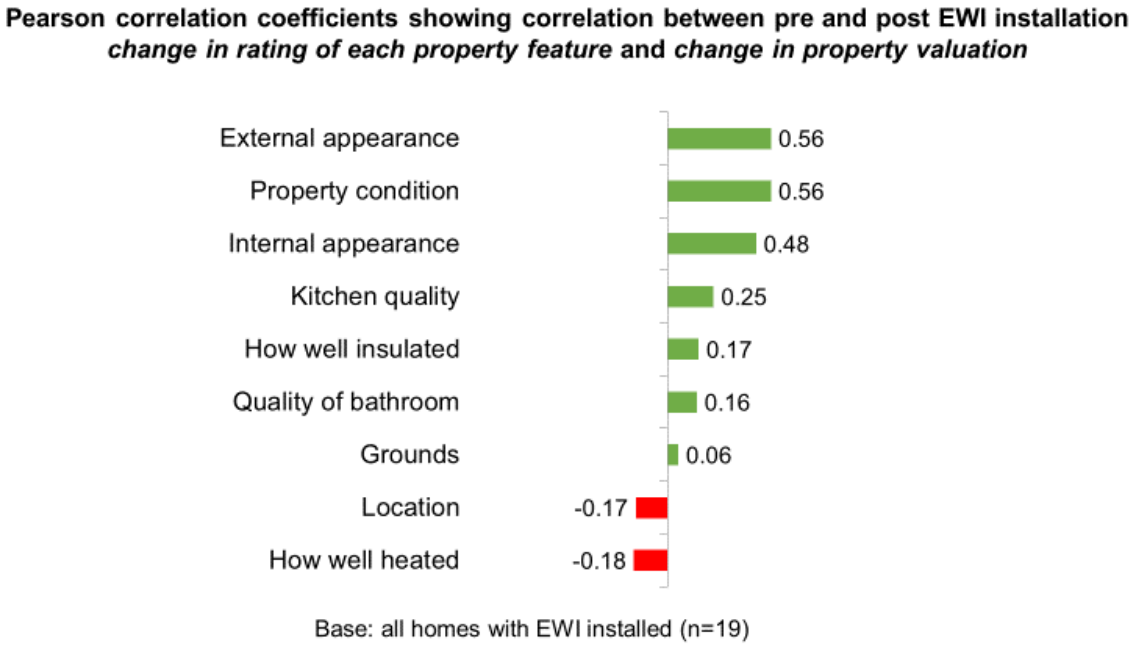
This is supported by feedback from surveyors in the qualitative interviews that the key improvement to the properties is the external appearance, which improves the properties' 'kerbside appeal.'

7.2. Correlation between value uplift and change in rating of features pre and post EWI installation

Statistical analysis has been done to determine if there is a meaningful correlation between the change in property value before and after the installation of EWI and the change in the rating of different property features.

Figure 11 shows the strength of correlation for each feature, in the form of Pearson R correlation coefficients.[13]

Figure 11: Key drivers of change in value of properties



The analysis has determined that there is a correlation between the change in property value and the change in external appearance and condition of a property (and, to a lesser extent, the internal appearance, although there was little internal work done in the research period).

On the other hand, there is little or no correlation between the change in property value (pre-installation to post-installation of EWI) and a change in the rating of the properties for how well insulated they are.

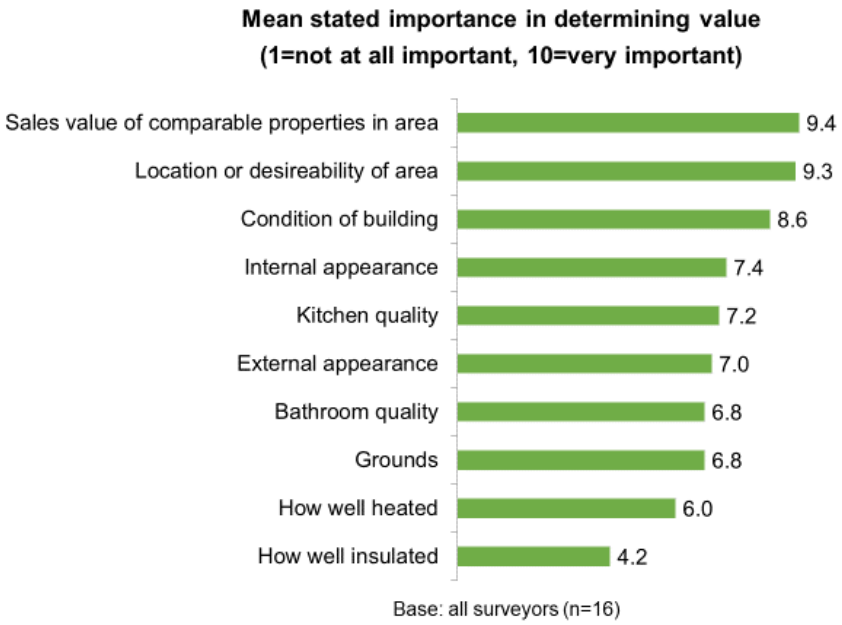
However, correlation is not necessarily causation. It is, therefore, useful to draw on two other pieces of evidence.

Firstly, in the interviews, surveyors state that property condition is a particularly important feature influencing the valuation of a property, whereas it is less important how well insulated a property is (that feature being the least important factor in property valuation).

[13] In statistical analysis, the Pearson R correlation coefficient is a measure of the linear correlation between two variables, in this case the change in property valuations between pre and post installation and the change in the rating from pre to post EWI installation for each specific property feature.

Surveyors were asked to rate the importance of different factors when valuing properties in general, using a scale of 1 (not at all important) to 10 (very important).

Figure 12: Stated importance of factors in property valuation



The key stated factors influencing property valuations in general are the sale value of comparable properties in the area, the desirability of the location and the condition of the building. External appearance is also rated as more important than how well insulated a property is. The latter feature is rated the *least* important of all the features considered.

Secondly, in the interviews conducted by Purple, surveyors indicate that they noted an improvement in the external appearance of the properties following EWI installation and tend to base their valuations on this improvement (and an increase in 'kerbside appeal') rather than taking into account any energy efficient benefits (including savings in the use and cost of energy).

As already indicated, there are energy cost savings associated with EWI (estimated by surveyors at around £200 per year), although surveyors generally do not tend to factor these into their valuations.

Valuers reflect the market and most purchasers make decisions to buy primarily on the easily visible characteristics, such as the general appearance of the property, the appearance of the kitchen and other obvious features, rather than less visible ones such as insulation and associated energy savings.

8. CONCLUSIONS

8.1. Determining if EWI adds value to a property

The average uplift in property value following EWI installation is just under £3,000 (3% of the property value). Although this is not a statistically significant increase (unless the analysis is restricted to cases in which the pre and post EWI installation valuations were both carried out by the same surveyor), it does demonstrate that surveyors, on average, place a higher value on a property with EWI installed compared to one without EWI.

The uplift in property value is mainly attributable to the change in the condition and external appearance of the property rather than an improvement in insulation or associated energy cost savings.

8.2. How rational is the market?

In this project the market is represented by the surveyors valuing properties. There is an irrationality in the market in the form of surveyors acknowledging, in the depth interviews, that EWI results in lower energy costs but not taking these into account when valuing a property.

If the market were acting rationally, it would consider the benefits to residents (or landlords) associated with EWI.

Table 11: Main benefits of installing external wall insulation and estimated value

Cost savings	BEIS estimates that the mean energy cost saving due to the installation of EWI is £180 per annum. Over a 36-year period, that saving is estimated to be approximately £5,000[14].
Improvement in external appearance of property	In 13 of the 19 properties where both pre-installation and post-installation valuations were done, an increase in the property value is recorded. Across all 19 properties, the mean change was an uplift of £3,000 (although this is not statistically significant). Statistical analysis identified the appearance and condition of the home as a major factor considered when valuing a property, and most surveyors interviewed attributed an uplift in value to an improvement in property appearance. An improvement in insulation and associated energy cost savings were perceived (by surveyors) to be lesser factors and most surveyors did not take these into account when carrying out their post-insulation valuation.

[14] Future energy savings are discounted to reflect consumers' preference for immediate benefits, in line with HM Treasury's Green Book guidance on economic appraisal (available at: https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government)

If the market were behaving rationally, there would be benefits valued at approximately £8,000 (the sum of the observed value uplift, associated with improved property appearance, and the present value of expected energy savings) that should be taken into account when valuing properties with EWI installed.

However, the mean uplift in property value in this study is approximately £3,000 following the installation of EWI, indicating that market valuations do not rationally reflect the total value of this energy efficiency measure.

8.3. The research process

A key objective of the project was to determine if the research methodology is effective in determining whether EWI adds value to a property when installed. If the methodology provides, or has the potential to provide, robust evidence of whether the installation of EWI increases property value, then the process can potentially be used to measure the impact of other energy efficiency measures on property value.

Although the current research has not definitively demonstrated that EWI adds significant value to a property, the research process has been shown, in this pilot exercise, to be practical and capable of generating relevant data. We believe that it can be used, with some modifications, to determine whether EWI does add value to a property.

Caveats take the form of recommended revisions to the process.

Table 12: Recommended revisions to research process

More robust sample	The sample (number of properties) needs to be more robust than managed in the current project, with a minimum of 65 properties required to yield greater statistical significance (although this would clearly be more costly).
Same surveyor doing pre and post installation valuations	Consideration should also be given to having the same surveyor conduct both the pre-installation and post-installation valuations, in order to minimise the variable that is the subjective view of the surveyor.
Sufficient lead time	Enough lead time is needed to book surveyors and for them to produce their written reports and valuations.
Overall time allowed	It should be assumed that the installation process will take longer than originally specified, and that the schedule will undergo revisions during the installation period.
Resident recruitment	Tenants should be recruited in-person (to build rapport) and be suitably incentivised, in this case to the value of £20 per resident per visit.

The methodology might also benefit from the inclusion of interviews with tenants.

It is also important to note that the current study addressed only local authority properties of a specific type in a specific area. It is not possible to extrapolate findings to cover other types of property (such as larger or more expensive properties, privately-owned properties or properties in other locations).

If research were required to explore the impact of EWI on the value of *other* types of property, an even larger sample size is likely to be required. The required sample size would depend on how many different types of property are to be covered in the research, but is likely to be in excess of 80 properties.

If the above recommendations are followed, we believe that there is merit in applying the research methodology to the installation of EWI in a larger and more diverse number of properties, and also to exploring the impact of other energy efficiency measures on property value.

APPENDIX: SURVEYOR INTERVIEW TOPIC GUIDE

SOLID WALL INSULATION PROPERTY VALUATION RESEARCH
SURVEYOR INTERVIEW GUIDELINES

INTRODUCTION

Thank you for participating in this research. Now that you have completed the valuations, we want to find out a bit more about the valuation process, including how and why you attribute value to particular property features.

This interview will last approximately 30 – 40 minutes.

Please note this is a bona fide research exercise and we are bound by the Market Research Society code of conduct and the General Data Protection Regulation. This guarantees you that the information you provide in this interview will remain anonymous and confidential.

IMPORTANCE OF FACTORS IN VALUATION

Please look at the list we emailed to you of the factors that might influence valuations you do in general.

Please rate the importance of each of the following factors from 1 (not at all important) to 10 (very important):

	Importance of each factor (1-10 importance)
Sale value of comparable properties in the area	
Location / desirability of area	
Condition of overall building – structurally sound, degree of disrepair, etc.	
The grounds – garden, presence of garage or off-street parking, etc.	
The external appearance	
The internal appearance – decorative state, internal fittings	
Quality of kitchen	
Quality of bathroom	
How well insulated the property is	
How well heated the property is	

Was anything else important when you were doing the valuation?
RECORD VERBATIM AND ALSO HOW IMPORTANT 0-10.

Which of these factors were the most important when you did the valuations?

PROPERTY VALUATION(S) – REPEAT FOR ALL VALUATIONS DONE

Address of first home valued	
Non-control home or control home?	
Did surveyor do pre-valuation only, post-valuation only or both for this property?	
Unique code allocated to home	
Type of property	
Number of bedrooms	
Pre-valuation given	
Post-valuation given	

Thinking about the home at (ADDRESS), you valued this at (VALUATION)…

What were the key factors in making the valuation?

Would you say that the valuation is in a certain range, say plus or minus a percentage? What would it be in this case?

IF THERE IS A DIFFERENCE BETWEEN THE PRE AND POST VALUATIONS:
What is the main reason there is a difference between the two valuations done on this property? (IF RESPONDENT DID NOT DO BOTH VALUATIONS, TELL HIM / HER WHAT THE OTHER VALUATION WAS)

Please rate each factor, from 1 (poor) to 10 (excellent) for each valuation you did on this property.

Factor	**Rating of property 1-10**	
	Pre-valuation	**Post-valuation**
Location / desirability of area		
Condition of overall building – structurally sound, degree of disrepair, etc.		
The grounds – garden, presence of garage or off-street parking, etc.		
The external appearance		
The internal appearance – decorative state, internal fittings		
Quality of kitchen		
Quality of bathroom		
How well insulated the property is		
How well heated the property is		

GENERAL QUESTIONS ON SOLID WALL INSULATION

IF POST-VALUATION DONE:

Did you notice that solid wall insulation had been done?

If so, how did it impact on your valuations, if at all?

Thinking about the solid wall insulation…

What do you think the benefits are of installing SWI in these homes?

What drawbacks or negatives, if any, would you associate with installing SWI in these homes?

Do you attempt to calculate the energy cost savings associated with SWI if it has been installed in a home?

Do you think that solid wall insulation adds any value to a home?

IF YES: How much?

IF NO: Why not?

ANY OTHER COMMENTS ON SOLID WALL INSULATION…

CLOSE

RECORD ANY OTHER RELEVANT INFORMATION FROM INTERVIEW.

THANK AND CLOSE

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