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**Supporting the “demand” side - First steps**

**A NWE condominium Quickscan technical assessment tool in all NWE languages**

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*Prepared by Changeworks – Deliverable DT2.1.2*

**Get to know your building better: The Quickscan Tool**



|  |  |
| --- | --- |
| **Who is this tool for?** | **Project team**  **Condominium Board** |
| **What is the purpose of this tool?** | The Quickscan Tool allows residents of a condominium to get an initial overview of suitable retrofit measures that could be installed within their building. These are measures that have the potential to improve the energy efficiency of the whole property envelope, not individual flats. |
| **How to use this tool?** | 1. Respond to a small number of questions requiring basic information related to the construction type and age of your condominium. 2. Review the relevant fact sheets which provide key facts, benefits and considerations 3. Refer to case studies and further information links where you feel this would be a benefit |
| **Next steps** | Have an informed discussion with your building manager or building professional. Ensure that you ask questions that might have been raised by the considerations section of the fact sheets. Make sure you are confident of what measures are being proposed, how the install will progress and the likely benefits. |

# What is the Quickscan Tool: Overview

All condominiums near the start point of their journey will need to consider what options are available to make their property more energy efficient. The Quickscan Tool is one of the resources that supports the ‘Preparing for Change’ stage of the Step by Step Guide to Energy Retrofitting in your Condominium and underpins the ‘Get to know your building better’ step. As such it complements additional ‘Preparing for Change’ tools that determine capacity, inspire action through case studies and look to secure commitment.

The Quickscan Tool allows residents of a condominium to get an initial overview of suitable retrofit measures that could be installed within their building. These are measures that have the potential to improve the energy efficiency of the whole property envelope, not individual flats. It is aimed at encouraging the uptake of multiple rather than single measures as part of a planned approach.

The Quickscan asks for a basic level of information about the property, and on that basis selects relevant factsheets that give the benefits, further considerations and links to relevant information related to that technology. A front cover sheet is provided which summarises information on the property provided by the resident and lists the feedback sheets selected as well as highlighting next steps to take.

By providing relevant information to residents on measures, they are in a better position to have a structured and informed discussion with a building professional. Residents will understand the options that might be available to them, they will know the benefits of the measure and the things they will need to consider. Considerations will need to form part of the discussion between the residents and building professionals. It will shape questions for building professionals providing advice or quoting for contracts and help to ensure the correct outcome is agreed.

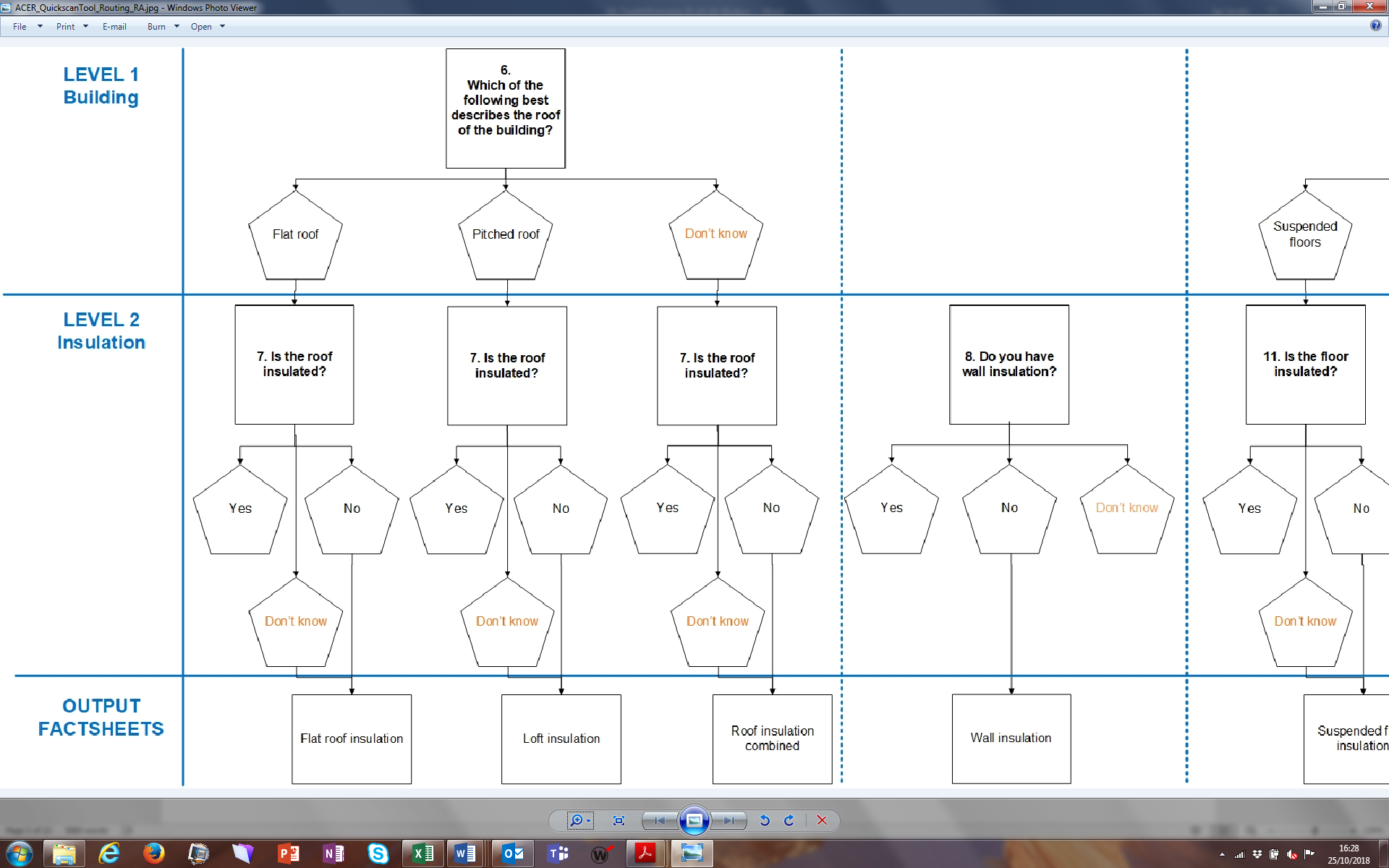
Each city or region looking to support retrofit of condominiums will need to provide basic technical advice in a format that fits with their approach for engaging residents. Variations will exist between cities covering content (e.g. language, signposting links for further information and support) and structure or form (e.g. hard copy, interactive online). The Quickscan Tool can therefore be adapted to be an interactive, online tool or in a simpler form, advice sheets can be printed off as hard copy pdfs. As such the resources provided as part of this toolkit comprise the building blocks for assembly into the appropriate form and guidance to reduce the time and resource required to do this.

# How does the Quickscan Tool work

In summary, any condominium resident should be able to provide some answers to basic questions related to their property and in response receive structured factsheets that are relevant to their property. This is summarised in the flow diagram below.



To provide information that is relevant to the condominium, there needs to be a selection from the ‘bank’ of factsheets in response to the questions about the property. The ‘routing’ used by the Quickscan is provided as a toolkit resource in Section 4 ([RD01](#_RD01:_Routing_Diagram)). An extract is provided below which covers roof insulation. It should be noted that ‘Don’t know’ options are provided for each question.



The maximum number of factsheets one person can receive is 6 (including coversheet) and the minimum is 3 (including coversheet). In some cases, where residents demonstrate limited knowledge of their building or the energy efficiency measures in place, the routing shown in Section 4 ([RD01](#_Routing_Diagram)) will be overridden and an energy efficiency measures summary sheet ([FS10](#_FS10:_Overview_of_1)) will be provided instead. The override rules are as follows and should ensure that visitors are not overwhelmed by information.

* If all 3 Level 1 (Q6, Q9, Q10) responses = “Don’t know”, all measures summary provided.
* If all 3 Level 2 (Q7, Q8, Q11) responses = “Don’t know”, all measures summary provided.
* If all 3 Level 2 (Q7, Q8, Q11) responses = “No”, all measures summary provided.

**Factsheets**

Once a visitor has entered the details requested in the questionnaire, they will be provided with a set of fact sheets (preceded by a cover sheet) outlining measures that may be suitable for them. In order to promote a holistic view of the building the cover page should include the following short paragraph (or something similar) with the correct, city level links within it:

“When considering upgrading your building to be more energy efficient, you should consider the whole building rather than individual properties or measures. There are some really useful case studies of this, for example [Low Energy Apartment Futures identifies best practice for retrofit](http://www.lowenergyapartments.eu/case-studies/). Since you live in a block of flats, you will need to work with other flat owners to develop and plan. For more advice on how to do that and progress your project, have a look at the other tools in the Step by Step Guide to Energy Retrofitting in your Condominium. The rest of this document contains specific factsheets about measures we think might be useful for you based on the information you have entered. In all cases, you should contact a professional to get a detailed quote before going ahead; the fact sheets should help you to get in touch with the right people.”

There are currently individual factsheets for the following specific measures:

* [FS00](#_FS00:_Cover_Sheet_1): Cover page -incl. low energy lighting and draught proofing (1 page)
* [FS01](#_FS01:_Flat_Roof_1): Flat roof insulation (1 page)
* [FS02](#_FS02:_Loft_Insulation): Loft insulation (1 page)
* [FS03](#_FS03:_Roof_Insulation): Roof insulation - pitched and flat (1.5 pages)
* [FS04](#_FS04:_Wall_Insulation): Wall insulation - internal and external (1.5 pages)
* [FS05](#_FS05:_Suspended_Floor): Suspended floor insulation (1 page)
* [FS06](#_FS06:_Solid_Floor): Solid floor insulation (1 page)
* [FS07](#_FS07:_Floor_Insulation): Floor insulation - solid and suspended (1.5 pages)
* [FS08](#_FS08:_Energy_Efficient): Energy efficient windows (1 page)
* [FS09](#_FS09:_Heating_system_1): Heating system upgrade (1 page)
* [FS10](#_FS10:_Overview_of_1): All measures summary (1.5 pages)

Indication of cost and potential savings are shown by the coin and star icons, respectively. Broadly speaking, 1 coin is indicative of an installation cost per property of less than €1000, 2 coins €1000 - €5000 and three coins to more than €5000. The coins indicate the approximate cost per property but are based on the assumption that the total installation costs are shared across the whole condominium. The star icons represent financial savings, and the values are indicative. Savings could also be measured as energy or carbon depending on the messaging of each city’s tool.

Providing users with the appropriate factsheets requires some routing based on the answers provided. The routing is shown in Section 4 ([RD01](#_Routing_Diagram)). The maximum number of factsheets one person can receive is 6 (including coversheet) and the minimum is 3 (including coversheet). In some cases, where visitors demonstrate limited knowledge of their building or the energy efficiency measures already in place, the routing shown on page will be overridden and an energy efficiency measures summary sheet ([FS10](#_FS10:_Overview_of_1)) will be provided instead. The override rules are as follows and should ensure that visitors are not overwhelmed by information.

* If all 3 Level 1 (Q6, Q9, Q10) responses = “Don’t know”, all measures summary provided.
* If all 3 Level 2 (Q7, Q8, Q11) responses = “Don’t know”, all measures summary provided.
* If all 3 Level 2 (Q7, Q8, Q11) responses = “No”, all measures summary provided

# Adapting the Quickscan for your City or Region

**Overview**

Each city or region looking to support retrofit of condominiums will need to provide basic technical advice in a format that fits with their approach for engaging residents. The Quickscan Tool is designed to provide information that is relevant and informative irrespective of where the condominium is located or how the information is provided. Adaptations can take two broad forms

1. Content: the text, images and language used as well as the visual design
2. Form: whether it is hard copy or an online interactive resource using an html or CMS route

Adaptations are tabulated below, and toolkit contents provided

|  |  |
| --- | --- |
| **Content** | **Resources Provided** |
| text | Text across all toolkit resources is generic where possible but cities will still be required to review and adapt text based on local archetypes, building regulations, links and references to case studies, general information and further support. Two examples of where this is relevant are given below   1. For Qu7 of the Condominium Questionnaire (CQ01): *Has your roof been insulated since 2002*, each city needs to update the relevant year for Building Regulations on loft insulation, before which the level of insulation might be regarding as inadequate 2. References to gas for heating and cooking may need to be reviewed in the Netherlands where the government wants to remove gas as source of heating and cooking for all residential buildings |
| language | English, French, German, Dutch translations provided |
| graphic design | One factsheet designed up with images, logos and ACE-Retrofitting cartoon graphic |
| **Form** |  |
| Hard Copy | Description, advantages and disadvantages and steps to implementation |
| HTML | Description, advantages and disadvantages and steps to implementation |
| CMS | Description, advantages and disadvantages and steps to implementation |

**Adaptation Options: Hard Copy**

|  |  |
| --- | --- |
| **Description** | Quickscan fact sheets are formatted and designed up to be available as printed versions. These can then be used by Cities who are engaging with the residents of a condominium and will have staff who are effectively selecting the correct sheets based on their circumstances (or having used the questionnaire).  The final output for the resident will be between 3-6 factsheets (pdfs) which can be provided electronically (e.g. email) or printed and made available as hard copies. |
| **Benefits** | * It allows partners to either work up a solution or develop hard copies that are in line with its needs. * Basic level of word processing required to make edits and change links * Totally devolved to project partners so cities can format to fit in with any design already being used on their project * Cities can design up in a short period of time at relatively low cost and have all the building blocks required |
| **Considerations** | * Does the city have the graphic design skills in house to format or is an external agency required * Does the city have the staff who can guide residents to use the appropriate sheets * Does the city have photographic images of measures that can be used. |

**Adaptation Options: HTML**

|  |  |
| --- | --- |
| **Description** | This involves creating the pages as a series of HTML web pages. All of the functionality that translates the information the resident enters into the information provided in response to their answers will be driven by Javascript or similar. |
| **Benefits** | * There will be a single collated output that residents can view online on computers and mobile devices and that can be printed off (assuming this is requested as part of the commissioning specification). * This option is relatively quick to deliver (4 weeks), especially if factored in when discussing the development of a website or portal to support a city or regional initiative and developing a tender for a digital agency. * A single collated output is generated which comprises the factsheets identified and coversheet. * It allows partners to develop a solution that meets their needs both as an interactive resource and hard copy if required. |
| **Considerations** | * This will likely require the use of an external digital agency which will develop the structure, routing and design issues. * It will require a brief to be developed to describe the requirements and may require a short tendering process. * A digital agency may cost €5,600-€8,400. * Changes to the information after the tool goes live requires someone with technical skills (HTML / CSS / Javascript). |

**Adaptation Options: Content Management System**

|  |  |
| --- | --- |
| **Description** | The Quickscan is created as a microsite using a Content Management System behind the scenes.  This becomes a preferred option if there were a number of regions interested in collaborating on content with a longterm view of hosting the microsite. The logic would remain consistent when rolled out to other regions. Each organisation will have their own login, separate view of the questions/ answers so they can personalise for their own markets and context. |
| **Benefits** | * There will be a single collated output that residents can view online on computers and mobile devices and can be printed off (assuming this is requested as part of the commissioning specification). * It allows partners to either work up a solution or develop hard copies that are in line with its needs. * Partner organisations can easily update content without needing technical skills. * If the city already has a website and have experience of the Content Management System, then the Quickscan might be able to be developed on the same CMS. * Reduced costs if regions with similar requirements are able to collaborate * Allows automatic collation of monitoring across a number of regions. |
| **Considerations** | * This will likely require the use of an external digital agency which will develop the structure, routing and design * It will require a brief to be developed to describe the requirements and may require a short tendering process * A digital agency may cost €14,000-€16,800 * More work in the set-up as you are implementing a CMS (c 8-10 weeks) * Introduces some ongoing costs in terms of hosting and applying security patches |

# Quickscan Toolkit

**Contents**

The toolkit comprises the following resources

|  |  |  |  |
| --- | --- | --- | --- |
| **Resource** | **Code** | **No** | **Description** |
| [Questionnaire](#_Condominium_Questionnaire) | CQ01 | 1 | Initial questions for residents on their property. Provides data on users for monitoring purposes and supports routing to the factsheets |
| [Factsheets](#_FS10:_Overview_of_1) | FS00 – FS10 | 11 | Nine factsheets  One cover sheet  One overview table |
| [Routing diagram](#_Routing_Diagram) | RD01 | 1 | Routing diagram to inform selection of factsheets and development of an HTML or CMS interactive solution |
| [Factsheet (draft design)](#_Factsheet:_Loft_Insulation) | FSD01 |  | Factsheet with image, ACE-Retrofitting-Interreg logos and basic design to fit with wider project resources |

# CQ01: Condominium Questionnaire

The questionnaire is designed to make the Tool user friendly and does not require a high level of technical knowledge at this early stage. Questions 1 – 5 are for research purposes only and do not impact the routing to the fact sheets. This will ensure that it is easier to translate the tool from one country context to another where response options may differ. Questions 6 – 11 deal directly with the existing building fabric and will be used to tailor the factsheet output.

1. Approximately when was your building constructed?

* Pre-1919
* 1920-1970
* 1970-2000
* Post-2000

2. How many floors are there in your building?

* Less than 3
* 3 -5
* 5 – 10
* 10 +

3. Approximately how many flats are there on each floor?

* 1 – 3
* 4 – 8
* 9 +

4. Which of the following best describes the main construction of the building?

* Solid stone
* Solid brick
* Concrete
* Timber frame
* Don’t’ know

5. Which of the following heating systems are used in your building?

* Gas boiler
* Electric heaters
* District heating
* Don’t know
* Other

6. Which of the following best describes the roof of your building?

* Pitched roof
* Flat roof
* Don’t know

7. Has your roof been insulated since 2002?

* Yes
* No
* Don’t know

8. Are your walls insulated?

* Yes
* No
* Don’t know

9. What type of windows do you have in your building?

* Single glazed
* Double glazed
* Triple glazed
* Don’t know

10. What type of floors do you have?

* Solid floors
* Suspended floors
* Don’t know

11. Is the floor insulated?

* Yes
* No
* Don’t know

# FS10: Overview of Measures

| **Measure** | **About** | **Key Considerations** | **Benefits** | **Indicative Cost and Savings** |
| --- | --- | --- | --- | --- |
| **Wall Insulation** *(General)* | Wall insulation reduces the amount of heat lost through the walls and can either be placed on the inside of the wall (internal wall insulation) or the outside (external wall insulation). |  | • The insulation maintains your home at a more consistent temperature; making your home feel warmer in the winter and cooler in the summer  • Pay less on your heating bills |  |
| **Internal** | Internal wall insulation can either be rigid panels fixed directly to the existing wall or the installation of a new stud wall with an insulating material added between this and the existing wall. | • Planning permissions is not normally required (unless if in a listed building)  • Room size will be affected by internal wall insulation and it can be disruptive to install | • There is no impact on the external appearance of your property and no need for scaffolding. | CoinsCoinsCoins  StarStarStar |
| **External** | External wall insulation uses panels of insulation fixed to the outside of the property and covered in a weather proof finish of your choice; typically, a render, brick or stone façade | • Rainwater pipes, power cables etc. will need to be removed and scaffolding is required   * If the external walls require any repairs, this will need to be done in advance   • Not suitable for listed or protected buildings | • Minimally disruptive as the major work takes place outside your property | CoinsCoinsCoins  StarStarStar |
| **Roof Insulation** *(General)* | Roof insulation reduces the amount of heat lost through the roof of the building. There are various solutions and material which can be used. | • Planning permission is not normally required though insulation needs to meet building regulations; check this with your supplier | • The insulation maintains your home at a more consistent temperature; making your home feel warmer in the winter and cooler in the summer  • Pay less on your heating bills |  |
| **Loft Insulation** | Loft insulation can be laid between the roof joists or the rafters to reduce the amount of heat lost through the roof. There are also options if there is a living space in the loft. | • Incorrect installation of loft insulation resulting in restricted airflow could result in a build-up of condensation which causes damp | • In some cases, loft insulation can be installed yourself, without the need for an external contractor | CoinsCoinsCoins  StarStarStar |
| **Flat roof Insulation** | Flat roofs can be insulated from above or below the existing roof; insulating from above is generally preferable. | • Installation can be complex and should be carried out by a professional |  | CoinsCoinsCoins  StarStarStar |
| **Floor Insulation**  *(General)* | Floor insulation reduces the amount of heat lost through the floor and the installation process differs based on the type of floor construction you have. | • Planning permission is not normally required though insulation needs to meet building regulations; check this with your supplier | • The insulation maintains your home at a more consistent temperature; making your home feel warmer in the winter and cooler in the summer  • Pay less on your heating bills |  |
| **Solid floor** | Rigid insulation boards are added to solid floors to add insulation. | • Carpet and flooring will need to be lifted and re-laid  • Door fittings and other fixtures will need to be altered as the floor level will be raised |  | CoinsCoinsCoins  StarStarStar |
| **Suspended floor** | Insulation can be added from above or below if there is a basement or cellar. | • Ensure that proper ventilation is maintained to avoid damp issues | CoinsCoinsCoins  StarStarStar |
| **Windows** | A lot of heat can be lost through windows if they are inefficient. Double glazed windows are comprised of two panes of glass sealed with a gap in between. This arrangement allows significantly better insulation than single pane windows. | • Ventilation must be sufficient after more efficient windows are installed to avoid condensation  • Installing double glazing may not be possible in listed or protected buildings; secondary glazing may be suitable in these cases  The building structure will need to accommodate and additional weight from the replacement windows | • Reduced draughts and cold spots near windows will improve comfort in your home  • Pay less on your heating bills  • Reduce noise in your home  • Improve security  • Reduce risk of condensation | CoinsCoinsCoins  StarStarStar |
| **Heating system upgrade** | See [FS09](#_FS09:_Heating_system_1) for details | | | |

# FS09: Heating system and controls upgrade

|  |  |  |  |
| --- | --- | --- | --- |
| **Measure** | **Key considerations** | **Benefits** | **Indicative Cost and Savings** |
| **Hot water tank and pipe insulation** | Insulating the hot water tank using a jacket and hot water pipes using tubing can help stop unnecessary heat loss.  Permission is not required for this, it is a simple measure and can often be done by the resident. | * Pay less on your energy bills * This can often be done yourself, without the need for an external contractor | CoinsCoinsCoins  StarStarStar |
| **Upgrade heating controls** | Upgrading heating controls will allow you use your heating system more efficiently. This includes a programmer to allow you to set the times you want the heating to come on and off, room thermostats to measure and set the temperature at which the heating system will turn off and thermostatic radiator valves (TRVs) which allow you control the temperature in individual rooms. | * Pay less on your energy bills * Tailor the temperature in your home to suit your preferences | CoinsCoinsCoins  StarStarStar |
| **Hot water tank thermostat** | A thermostat placed correctly on the hot water cylinder can be programmed to switch the boiler off when it has reached the required temperature and on again if it drops too low. This will avoid using more energy than needed.  Installation should be completed by a qualified heating engineer or electrician. | * Pay less on your energy bills | CoinsCoinsCoins  StarStarStar |
| **Upgrade boiler (to condensing boiler)** | Condensing boilers are much more efficient than other types of boilers meaning that they use less fuel to provide the same amount of heat. Oil, LPG and gas boilers can be upgraded to condensing boilers.  Installation should be completed by an accredited heating engineer and should comply with building regulations. | * Pay less on your energy bills * Reduce the carbon footprint of heating your home | CoinsCoinsCoins  StarStarStar |
| **Upgrade to smart storage heaters** | Smart storage heaters have more insulated heat storage bricks, high accuracy thermostats and better programming capability. This means that you can better control how much and when heat is released into the home and maintain temperatures that are comfortable for you.  Installations should be completed by an accredited installer. | * Pay less on your energy bills * Tailor the temperature in your home to suit your preferences | CoinsCoinsCoins  StarStarStar |
| **Upgrade to condensing gas boiler (switch fuel)** | Heating your home using oil, LPG or electricity is more expensive than using mains gas. To switch to gas there must be a mains gas connection close by, and if your home is not already connected to mains gas, there will be an initial cost to get the gas and meter installed.  Installation should be completed by an accredited heating engineer and should comply with building regulations. | * Pay less on your energy bills | CoinsCoinsCoins  StarStarStar |
| **Heat pumps** | Heat pumps can either use heat from the ground (Ground Source Heat Pumps) or the air (Air Source Heat Pumps) to heat radiators, hot water or underfloor heating systems.  Switching to heat pumps is most effective if you are currently using electricity for heating and when your property is well insulated. | * Pay less on your energy bills * Minimal maintenance required | CoinsCoinsCoins  StarStarStar |
| **District/Communal heating system** | District heating is when one large boiler serves more than one property. This is more efficient than having lots of individual boilers so heating costs can be reduced. Joining a district heating network will most likely require a long term (~25 year) contract. | * Pay less on your energy bills * Reduce carbon footprint | CoinsCoinsCoins  StarStarStar |

# FS00: Cover Sheet

**About your property**

You’ve told us that you live in a X floor block of flats which was built in XXXX. The main construction type is XXXXXXXXXXXXXXXXXXXX and your property is heated by XXXXXX.

In general, when considering upgrading your building to be more energy efficient, you should consider the whole building rather than individual measures. There are some really great examples of this [LINK] and [LINK]. Since you live in a block of flats, some measures will require you to work with other flat owners. For more advice on how to do this, have a look at our Guide [LINK]. The rest of this document contains some specific factsheets about measures we think might be useful for you based on the information you have entered. In all cases, you should contact a professional to get a detailed quote before going ahead; the factsheets should help you to get in touch with the right people.

**Some simple things**

*Draught Proofing*

Small gaps around external fittings like doors and windows can let warm air from inside your home escape and let cold air in, causing draughts. Reducing draughts can improve comfort in your home and allow you to turn your thermostat down and make more savings on your bills. Different types of draught proofing are available for different situations. The main options for DIY draught proofing are: fabric draught excluders, foam strips, brush or rubber strips, compression seals and sealant.

Remember to draught-proof the doors and windows in communal areas such as stairwells, vestibules and lobbies, as well as each flat in the building.

The [LINK] has more detailed information on various types of draught proofing materials and methods.

*Low energy Lighting*

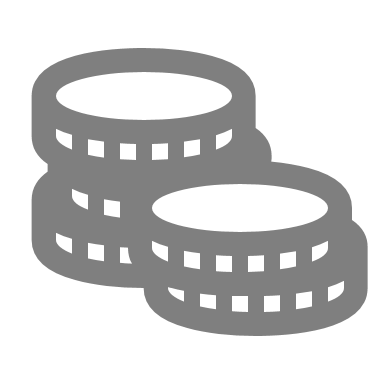
Low energy lightbulbs use much less electricity to produce the same amount of energy as traditional lightbulbs. Switching these is an easy way to save money on your electricity bills. There are a few different options for low energy lighting including Compact Fluorescent Lights (CFLs) and Light Emitting Diodes (LEDs) which replace traditional bulbs and energy efficient strip lights. Like traditional bulbs, energy savings ones are available in different sizes, shapes and brightness and with both bayonet and screw fittings.

The [LINK] [e.g. [Energy Saving Trust](http://www.energysavingtrust.org.uk/home-energy-efficiency/lighting/energy-saving-light-bulbs)] has more information on choosing suitable energy efficient lighting for you.

# **FS01: Flat Roof Insulation**

**About**

**Typical costs:**

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**Typical annual savings:**

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* A flat roof can be insulated from either above or below the existing roof. If insulating from above, a new weatherproof layer will need to be added so it is advisable to do this when the roof needs replacing anyway. In general, above roof insulation is preferable as it has lower chance of leading to condensation build-up which can cause damp issues.

**Benefits**

* The insulation maintains your home at a more consistent temperature; making your home feel warmer in the winter and cooler in the summer
* Pay less on your heating bills.

**Key considerations**

* Materials: Flat roof insulation usually uses rigid insulation boards.
* Ventilation: Incorrectly installed flat roof insulation installed below the roof can lead to damp problems so care should be taken to ensure adequate ventilation.
* Permissions: Flat roof insulation does not normally require planning permission. However the insulation installed may be required to meet building regulations. Your installer should know about this but if in doubt, check this with your local authority.
* Installation process: If insulation is installed above the existing roof, it consists of a rigid insulation board placed on top of the weatherproof layer with a new weatherproof layer added on top. If insulation is installed below the existing roof, battens are installed in the ceiling space and the gap filled with insulation material before the plasterboard is replaced. Both methods of flat roof insulation can be difficult and should be carried out by a professional.

**Further information**

* Case studies:
  + [Budapest](http://www.lowenergyapartments.eu/wp-content/uploads/2016/03/LEAF_Case_study_showcase_Hungary_D8.4_Feb16.pdf) (Hungary)
  + [Glasgow](http://www.retrofitscotland.org/case-studies/caledonia-road-hutchesontown-glasgow/?filters=2776) (UK)
* Useful information:
  + [National Insulation Association](https://www.nia-uk.org/) (NIA): Trade Association with list of approved installers
  + The [Energy Saving Trust](http://www.energysavingtrust.org.uk/home-insulation/roof-and-loft): More detailed information about loft and roof insulation.

# FS02: Loft Insulation

**About**

**Typical costs:**

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**Typical annual savings:**

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* Loft insulation can be laid between the roof joists or the rafters to reduce the amount of heat lost through the roof. There are also options for loft insulation in cases where the loft is used for storage, as a living space or is inaccessible.

**Benefits**

* The insulation maintains your home at a more consistent temperature; making your home feel warmer in the winter and cooler in the summer
* Pay less on your heating bills
* In some cases, loft insulation can be installed by the resident, without the need for an external contractor.

**Key considerations**

* Materials: Loft insulation can come in various forms and the most appropriate one will depend on the arrangement of the roof rafters, whether the roof space is used for storage or living space, obstructions in the loft space or lack of space. Common options available include blanket insulation (or matting) which can be rolled out in most loft spaces, rigid insulation boards used when space is limited, or loose fill insulation used for irregular spaces.
* Existing insulation: If you already have loft insulation it is worth checking that it is at least 270mm deep and has been correctly installed. You can top-up existing loft insulation to meet current standards.
* Ventilation: Incorrect installation of loft insulation resulting in restricted airflow could result in a build-up of condensation which causes damp. Check that there is sufficient ventilation in the roof before you begin.
* Permissions: Planning permission is not required for loft insulation however the insulation installed may be required to meet building regulations. Your installer should know about this but if in doubt, check this with your local authority.
* Installation process: Installation of loft insulation is usually straightforward. In cases where there is no existing damp or major obstructions in the loft space, it can be installed yourself. If there is a living space in the roof, the installation is more complex and should be conducted by a professional.

**Further information**

* Case studies:
  + [Aachen](http://www.lowenergyapartments.eu/wp-content/uploads/2016/03/LEAF_Case_study_showcase_Germany_D8.4_Feb16.pdf) (Germany)
  + [Edinburgh](http://www.lowenergyapartments.eu/wp-content/uploads/2016/03/LEAF_Case_study_showcase_Scotland_D8.4_Feb16%E2%80%99.pdf) (UK)
* Useful information:
  + [National Insulation Association](https://www.nia-uk.org/) (NIA): Trade Association with list of approved installers
  + [The Energy Saving Trust](http://www.energysavingtrust.org.uk/home-insulation/roof-and-loft): more detailed information about loft and roof insulation.

# FS03: Roof Insulation

**About**

**Typical costs:**

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**Typical annual savings:**

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* Depending on what type of roof you have, either flat or pitched, there are a variety of options for adding insulation. If your roof is pitched, you can add insulation between the roof joists or rafters and there are options in the roof is used a living space. A flat roof can be insulated from either above or below the existing roof.

**Benefits**

* The insulation maintains your home at a more consistent temperature; making your home feel warmer in the winter and cooler in the summer
* Pay less on your heating bills.

**Key Considerations**

*Pitched roof*

* Materials: Loft insulation can come in various forms and the most appropriate one will depend on the arrangement of the roof rafters, whether the roof space is used for storage or living space, obstructions in the loft space or lack of space. Common options available include blanket insulation (or matting) which can be rolled out in most loft spaces, rigid insulation boards used when space is limited, or loose fill insulation used for irregular spaces.
* Ventilation: Incorrect installation of loft insulation resulting in restricted airflow could result in a build-up of condensation which causes damp. Check that there is sufficient ventilation in the roof before you begin.
* Permissions: Planning permission is not required for loft insulation however the insulation installed may be required to meet building regulations. Your installer should know about this but if in doubt, check this with your local authority.
* Installation process: Installation of loft insulation is usually straightforward. In cases where there is not existing damp or major obstructions in the loft space, it can be installed by the resident. If there is a living space in the roof, the installation is more complex and should be conducted by a professional.

*Flat roof*

* Materials: Flat roof insulation usually uses rigid insulation boards.
* Ventilation: Incorrectly installed flat roof insulation installed below the roof can lead to damp problems so care should be taken to ensure adequate ventilation.
* Permissions: Flat roof insulation does not normally require planning permission however the insulation installed may be required to meet building regulations. Your installer should know about this but if in doubt, check this with your local authority.
* Installation process: If insulation is installed above the existing roof, it consists of a rigid insulation board placed on top of the weatherproof layer with a new weatherproof layer added on top. If insulation is installed below the existing roof, battens are installed in the ceiling space and the gap filled with insulation material before the plasterboard is replaced. Both methods of flat roof insulation can be difficult and should be carried out by a professional.

**Further information**

* Case studies:
  + [Aachen](http://www.lowenergyapartments.eu/wp-content/uploads/2016/03/LEAF_Case_study_showcase_Germany_D8.4_Feb16.pdf) (Germany)
  + [Edinburgh](http://www.lowenergyapartments.eu/wp-content/uploads/2016/03/LEAF_Case_study_showcase_Scotland_D8.4_Feb16%E2%80%99.pdf) (UK)
  + [Budapest](http://www.lowenergyapartments.eu/wp-content/uploads/2016/03/LEAF_Case_study_showcase_Hungary_D8.4_Feb16.pdf) (Hungary)
  + [Glasgow](http://www.retrofitscotland.org/case-studies/caledonia-road-hutchesontown-glasgow/?filters=2776) (UK)
* Useful information:
  + [National Insulation Association](https://www.nia-uk.org/) (NIA): Trade Association with list of approved installers
  + [The Energy Saving Trust](http://www.energysavingtrust.org.uk/home-insulation/roof-and-loft): more detailed information about loft and roof insulation.

# FS04: Wall Insulation

**About**

**Typical costs:**

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**Typical annual savings:**

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Wall insulation can either be placed on the inside of the wall (internal wall insulation) or the outside (external wall insulation). When internal wall insulation in applied, this can either be rigid panels fixed directly to the existing wall or the installation of a new stud wall with an insulating material added between this and the existing wall. External wall insulation uses panels of insulation fixed to the outside of the property and covered in a weather proof finish of your choice; typically, a render, brick or stone façade

**Benefits**

* The insulation maintains your home at a more consistent temperature; making your home feel warmer in the winter and cooler in the summer
* Pay less on your heating bills
* *Internal wall insulation:* There is no impact on the external appearance of your property and no need for scaffolding.
* *External wall insulation*: Improves the appearance of your building which can increase the value. Can also provide some protection to the structure from wind and rain.

**Key Considerations**

*Internal Wall Insulation*

* Permissions: Planning permission is not normally required for internal wall insulation though this may differ for listed buildings as it changes the fabric of the wall.
* Materials: There are two options for internal wall insulation; insulation boards made of foamed plastic which are fixed directly to the existing walls or the installation of a new stud wall with an insulating material added between the new and existing walls.
* Ventilation*:* Any existing issues with damp must be dealt with before installation as adding internal wall insulation can exacerbate the issue.
* Remedial work: This type of insulation will reduce room size which may make it unsuitable in particularly small rooms; however, there are some slim materials that can be used.
* Installation process: Internal wall insulation can be disruptive and will require internal fittings (e.g. skirting boards, radiators, pipework) to be removed during installation. Due to the impact on decorative features such as cornicing, it may be inappropriate for some buildings. Insulation should also be installed in communal areas such as stairwells and lobbies.

*External Wall Insulation*

* Permissions: External wall insulation is not appropriate for buildings which are listed or protected as it changes the appearance of the building. You may need to seek planning permission and apply for a building permit.
* Repair work: This type of insulation may not be appropriate if there are structural issues with the building.
* Materials: Ask an expert about the different types of materials available and check the materials adhere to fire safety and building regulations. A range of different types of materials can be used; some of these materials are more sustainable than others, ask your installer about the different options available.
* Remedial work: Wall fixings, such as rainwater pipes, power cables or satellite dishes will need to be removed and re-attached. For properties with a balcony, your installer should include a solution to prevent cold travelling through the structure and causing internal damp (‘thermal-bridging’).
* Installation: The installation process requires scaffolding and will produce some noise and dust. However, the work is not very disruptive as it all takes place outside. You will need to work with all the flat owners to install external wall insulation; for advice and information on how to do this, please see our Guide [LINK].

**Further Information**

* Case studies:
  + [Blackley](https://www.nia-uk.org/consumer/media/1094/kingspan-lakeside-manchester.pdf) (UK)
  + [Saint Etienne](http://www.lowenergyapartments.eu/wp-content/uploads/2016/03/LEAF_Case_study_showcase_France_D8.4_Feb16.pdf) (France)
  + [Glasgow](http://www.retrofitscotland.org/case-studies/james-nisbet-street-roystonhill-glasgow/?filters=1491) (UK)
* Useful information:
  + [Insulation and Cladding Association](https://www.inca-ltd.org.uk/) (INCA): Trade Association with list of approved installers
  + [National Insulation Association](https://www.nia-uk.org/) (NIA): Trade Association with list of approved installers
  + [Solid Wall Insulation Guarantee Agency](https://www.swiga.co.uk/) (SWIGA): Quality Assurance Framework and Guarantee for solid wall insulation provides access to technical expertise in the event of any defect arising in the design, workmanship or materials
  + [Energy Saving Trust](http://www.energysavingtrust.org.uk/sites/default/files/reports/Solid%20wall%20-%20internal%20wall%20insulation_0.pdf): more detailed information about internal wall insulation

# FS05: Suspended Floor Insulation

**Typical costs:**

****

**Typical annual savings:**

****

**About**

* Suspended floors are where finished floorboards are laid over joists (beams that run underneath the floorboards) which are raised from the ground. This type of floor construction allows air to circulate and helps to prevent damp.

**Benefits**

* The insulation maintains your home at a more consistent temperature; making your home feel warmer in the winter and cooler in the summer
* Pay less on your heating bills.

**Key considerations**

* Repair work needed: Any existing damp issues should be dealt with before installing insulation.
* Materials: Either rigid insulation boards held in place by battens or matting (or blanket insulation) held in place by nets can be used.
* Ventilation: Care should be taken to ensure that air bricks are not blocked when installing insulation as this can result in insufficient ventilation leading to damp issues.
* Permissions: While planning permission is not usually required, the insulation installed may be required to meet building regulations. Your installer should know about this but if in doubt, check this with your local authority.
* Installation process: Insulating a floor can either be done from below if there is access from a basement or cellar, or from above by removing the floorboards. Insulating from below is easier and therefore advisable. In both cases, insulation is added between the joists either as rigid insulation boards held in place by battens or as matting held in place by nets. If the insulation is added from above, the battens or nets will need to be in place first.

**Further information**

* Case studies:
  + [Perthshire](http://www.retrofitscotland.org/case-studies/annat-road-perthshire/?filters=1477) (UK)
* Useful information:
  + [National Insulation Association](https://www.nia-uk.org/) (NIA): Trade Association with list of approved installers
  + The [Energy Saving Trust:](http://www.energysavingtrust.org.uk/home-insulation/floor) More information on floor insulation.

# FS06: Solid Floor Insulation

**About**

**Typical costs:**

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**Typical annual savings:**

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* Solid concrete floors can be insulated by adding a layer of rigid insulation board on top. The carpet or flooring can then be re-laid.

**Benefits**

* The insulation maintains your home at a more consistent temperature; making your home feel warmer in the winter and cooler in the summer
* Pay less on your heating bills.

**Key considerations**

* Permissions: Planning permission is not usually required, however the insulation installed may be required to meet building regulations. Your installer should know about this but if in doubt, check this with your local authority.
* Remedial work: Since the floor level will be raised by adding the insulation board, door openings, stairs and other fixtures will need to be altered which will incur an additional cost.
* Installation process: Installation will require the carpet or flooring to be lifted, adding an insulating layer and re-laying the flooring. This can be disruptive as rooms will need to be cleared for the carpet or flooring to be lifted. It is highly recommended to also install a damp proof membrane layer as this will help to prevent damp issues.

**Further information**

* Case studies:
  + [Dumbarton](http://www.retrofitscotland.org/case-studies/merkins-avenue-dumbarton/?filters=1491) (UK)
* Useful information:
  + [National Insulation Association](https://www.nia-uk.org/) (NIA): Trade Association with list of approved installers

# FS07: Floor Insulation

**Typical costs:**

***(depending on floor type)***

** suspended**

** solid**

**Typical annual savings:**

****

**About**

* Floors are either usually solid or suspended. Suspended floors are where finished floorboards are laid over joists (beams that run underneath the floorboards) which are raised from the ground. These can be insulated either from below (if there is a basement) or above. Solid concrete floors can be insulated by adding a layer of rigid insulation board on top. The carpet or flooring can then be re-laid.

**Benefits**

* The insulation maintains your home at a more consistent temperature; making your home feel warmer in the winter and cooler in the summer
* Pay less on your heating bills

**Key Considerations**

To install floor insulation, you may need to work with other flat owners; for advice and information on how to do this, please see our Guide [LINK].

*Suspended floor insulation*

* Repair work needed: Any existing damp issues should be dealt with before installing insulation.
* Materials: Either rigid insulation boards held in place by battens or matting (or blanket insulation) held in place by nets can be used.
* Ventilation: Care should be taken to ensure that air bricks are not blocked when installing insulation as this can result in insufficient ventilation leading to damp issues.
* Permissions: While planning permission is not usually required, the insulation installed may be required to meet building regulations. Your installer should know about this but if in doubt, check this with your local authority.
* Installation process: Insulating a floor can either be done from below if there is access from a basement or cellar, or from above by removing the floorboards. Insulating from below is easier and therefore advisable. In both cases, insulation is added between the joists either as rigid insulation boards held in place by battens or as matting held in place by nets. If the insulation is added from above, the battens or nets will need to be in place first.

*Solid floor insulation*

* Permissions: Planning permission is not usually required, however the insulation installed may be required to meet building regulations. Your installer should know about this but if in doubt, check this with your local authority.
* Remedial work: Since the floor level will be raised by adding the insulation board, door openings, stairs and other fixtures will need to be altered which will incur an additional cost.
* Installation process: Installation will require the carpet or flooring to be lifted, adding an insulating layer and re-laying the flooring. This can be disruptive as rooms will need to be cleared for the carpet or flooring to be lifted. It is highly recommended to also install a damp proof membrane layer as this will help to prevent damp issues.

**Further Information**

* Case studies:
  + [Perthshire](http://www.retrofitscotland.org/case-studies/annat-road-perthshire/?filters=1477) (UK)
  + [Dumbarton](http://www.retrofitscotland.org/case-studies/merkins-avenue-dumbarton/?filters=1491) (UK)
* Useful information:
  + [National Insulation Association](https://www.nia-uk.org/) (NIA): Trade Association with list of approved installers
  + The [Energy Saving Trust:](http://www.energysavingtrust.org.uk/home-insulation/floor) More information on floor insulation.

# FS08: Energy Efficient Windows

**Typical costs:**

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**Typical annual savings:**

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**About**

* Upgrading windows can help reduce heat loss. Double glazed windows are comprised of two panes of glass sealed with a gap in between. This arrangement allows significantly better insulation than single pane windows. Other options include triple glazing and secondary windows.

**Benefits**

* Reduced draughts and cold spots near windows will improve comfort in your home
* Pay less on your heating bills
* Reduce noise in your home
* Improve security
* Help combat condensation problems.

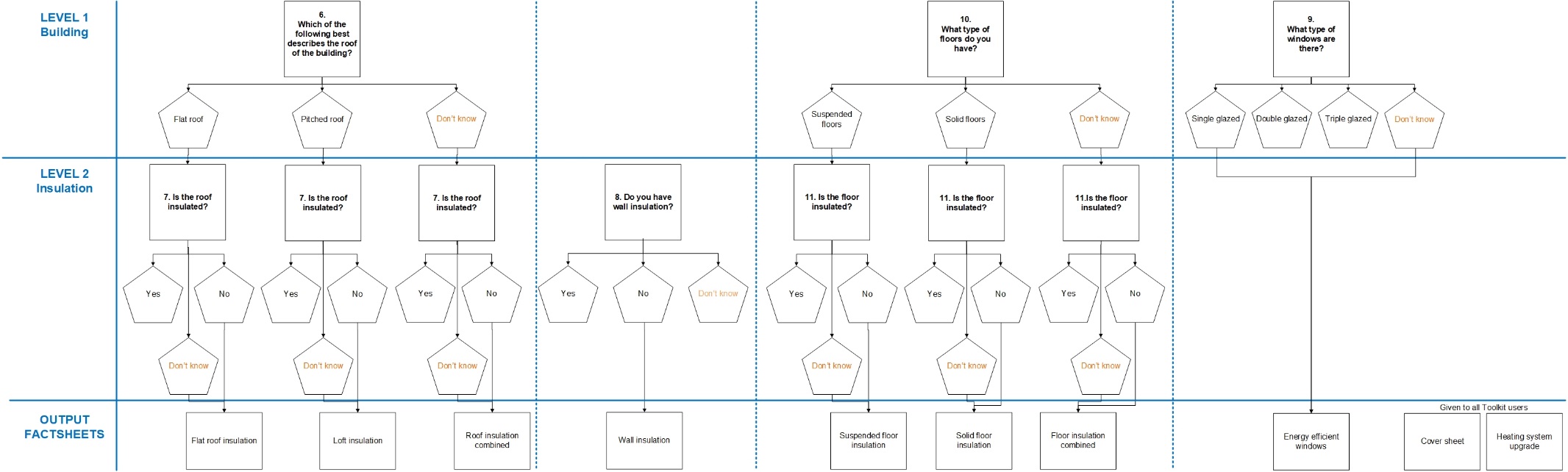
**Key Considerations**

* Materials: The most energy efficient windows have a low emissivity (low-e) coating which allows light in but stops warmth escaping. Frames for double glazed windows can be made from uPVC (long lasting), wood (requires maintenance, often used in conservation areas) or steel/aluminium. Ensure that you have confirmation from your installer that the building structure can support any additional weight from the new windows.
* Ventilation: New double glazed windows are likely to be more airtight than your old ones which can lead to a build-up of condensation. Modern double-glazed windows may have trickle vents which should be opened to allow moisture to escape and avoid damp if there is not much background ventilation.
* Permissions: Planning permission is not normally required unless the property is in a conservation area or a listed building; in these cases, [secondary glazing](https://www.cse.org.uk/advice/advice-and-support/secondary-glazing) may be more appropriate. Check with your local authority if you are unsure.
* Maintenance: Double glazing has a typical lifetime of around 20 years after which they may need to be replaced or repaired depending on the exact type of glazing used.

**Further information**

* Case studies:
  + [Budapest](http://www.lowenergyapartments.eu/wp-content/uploads/2016/03/LEAF_Case_study_showcase_Hungary_D8.4_Feb16.pdf) (Hungary)
  + [Glasgow](http://www.retrofitscotland.org/case-studies/james-nisbet-street-roystonhill-glasgow/?filters=1491) (UK)
  + [Edinburgh](http://www.retrofitscotland.org/case-studies/22-drummond-street-edinburgh/?filters=1267) (UK)
  + [Edinburgh](http://www.retrofitscotland.org/case-studies/2-roxburgh-street-(1st-floor)-edinburgh/?filters=2810) (UK)
* Useful information:
  + The [Energy Saving Trust](http://www.energysavingtrust.org.uk/home-energy-efficiency/energy-efficient-windows): More detailed information on energy efficient windows.
  + [Glass and Glazing Federation](http://www.ggf.org.uk/): Industry best practice membership organisation with list of approved installers.

# RD01: Routing Diagram



# Factsheet: Loft Insulation

**Typical costs:**

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**Typical annual savings:**

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**About**

* Loft insulation can be laid between the roof joists or the rafters to reduce the amount of heat lost through the roof. There are also options for loft insulation in cases where the loft is used for storage, as a living space or is inaccessible.

**Benefits**

* The insulation maintains your home at a more consistent temperature; making your home feel warmer in the winter and cooler in the summer
* Pay less on your heating bills
* In some cases, loft insulation can be installed by the resident, without the need for an external contractor.

**Key considerations**

* Materials: Loft insulation can come in various forms and the most appropriate one will depend on the arrangement of the roof rafters, whether the roof space is used for storage or living space, obstructions in the loft space or lack of space. Common options available include blanket insulation (or matting) which can be rolled out in most loft spaces, rigid insulation boards used when space is limited, or loose fill insulation used for irregular spaces.
* Existing insulation: If you already have loft insulation it is worth checking that it is at least 270mm deep and has been correctly installed. You can top-up existing loft insulation in order to meet current standards.
* Ventilation: Incorrect installation of loft insulation resulting in restricted airflow could result in a build-up of condensation which causes damp. Check that there is sufficient ventilation in the roof before you begin.
* Permissions: Planning permission is not required for loft insulation however the insulation installed may be required to meet building regulations. Your installer should know about this but if in doubt, check this with your local authority.
* A picture containing building, outdoor, fence, sofa

  Description automatically generatedInstallation process: Installation of loft insulation is usually straightforward. In cases where there is no existing damp or major obstructions in the loft space, it can be installed yourself. If there is a living space in the roof, the installation is more complex and should be conducted by a professional.

**Further information**

* Case studies:
  + [Aachen](http://www.lowenergyapartments.eu/wp-content/uploads/2016/03/LEAF_Case_study_showcase_Germany_D8.4_Feb16.pdf) (Germany)
  + [Edinburgh](http://www.lowenergyapartments.eu/wp-content/uploads/2016/03/LEAF_Case_study_showcase_Scotland_D8.4_Feb16%E2%80%99.pdf) (UK)
* Useful information:
  + [National Insulation Association](https://www.nia-uk.org/) (NIA): Trade Association with list of approved installers

[The Energy Saving Trust](http://www.energysavingtrust.org.uk/home-insulation/roof-and-loft): more detailed information about loft and roof insulation.