



carrigaline Tidy Towns
SUSTAINABLE ENERGY COMMUNITY

Carrigaline Energy Masterplan
June 2023

Annex B:
Case Studies
on
How to Make Your House
Warm and Comfortable



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Carrigaline Sustainable Energy Community

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Retrokit

Background

The momentum within the country has been to upgrade the fabric of buildings so that heat pumps can be utilised as the primary heating source. However, in order for heat pumps to be a viable option, buildings need to be insulated to a level where they have a Heat Loss Indicator of 2.0 or less. SEAI define these dwellings as being ‘heat pump ready’¹. If properties are not insulated to an adequately high level, then this technology is not suitable as a primary heat source.

The government’s climate action plan has set a BER of B2 as the target for the energy performance of retrofitted homes. This target is in line with current building regulations - ‘Part L conservation of fuel and energy’², which specifies that buildings undergoing ‘Major Renovations’³ must achieve a BER B2 or a ‘Cost Optimal’ level of energy performance.

In order to accurately identify the fabric upgrades that need to be carried out to upgrade Carrigaline’s residential housing stock to a BER rating of B2 (or better) and to achieve “heat pump readiness”, a software package known as ‘RetroKit’ was employed.

¹ Heat Loss Indicator (HLI) value is the total heat loss per m2 of dwelling floor area. A minimum HLI of 2 Watts/Kelvin/m2 must be achieved to be suitable for a heat pump however in some cases, where upgrades may not be cost- optimal, a value of HLI up to 2.3 Watts/Kelvin/m2 can be accepted provided additional requirements are met

2

Method

RetroKit is a decision-support tool developed by RetroKit Ltd. which compiles a wide range of data sources and applies analytics to establish the current energy performance of the housing stock in a community. It generates baseline data on energy performance of the housing stock in terms of energy use, expenditure, CO₂ emissions, BER rating and Heat Loss Indicator amongst many other variables.

RetroKit uses this data to develop and compare a range of retrofit scenarios:

1. Shallow fabric
2. Medium – (oil boiler)
3. Medium – (heat pump)
4. Deep Retrofit (heat pump)

The software conducts a cost/benefit analysis of each scenario in order to identify the optimum retrofit package for the community’s housing stock and considers not only the technical factors, but also financial and environmental concerns.

² <https://assets.gov.ie/180475/e532a9c5-3ec6-4a4c-8309-02f8a653e2d8.pdf>

³Major renovations refer to upgrades where more than 25% of the building envelope. Painting, re-plastering, rendering, re-slating, re-tiling, cavity wall insulation and insulation of ceiling are not considered major renovation works.

Carrigaline SEC Energy Master Plan

These scenarios are applied against the most common house types in the Carrigaline community in order to exemplify what fabric upgrades would take place in each typical home through a home energy upgrade plan.

Whilst the use of standard assumptions (e.g. fixed heating schedules and hot water usage) means that running costs and energy usage estimated by RetroKit will differ somewhat from actual data for specific dwellings, they provide a highly detailed representation of what the impact of a retrofit project would be for typical residencies in the Carrigaline community.

These home energy upgrade plans will help homeowners in the Carrigaline community understand how a house like theirs can be upgraded, the typical costs involved and include a breakdown of the revised BER rating, energy consumption, energy costs and payback period of the investment for the homeowner, along with many other variables for each scenario.

Measures are only applied by RetroKit where required and appropriate. This is done on a dwelling by dwelling basis. For example, for cavity wall insulation measures, RetroKit checks to see if the dwelling has a "cavity" wall and if the wall heat loss is high (and therefore worth insulating) before applying that measure.

RetroKit Scenario	Non-exhaustive summary of works
Shallow Fabric	Basic measures such as better air tightness, cavity and loft insulation, cylinder insulation, LED lights and wood stove
Medium (boiler)	"Shallow fabric" plus External Wall Insulation, boiler, controls, new door, double glazing
Medium (Heat pump)	"Shallow fabric" plus External Wall Insulation, heat pump, controls, new door, double glazing
Deep (Heat Pump)	Medium (Heat Pump)" plus triple glazing, sloping ceiling internal insulation, demand control ventilation, Photovoltaic (PV) system

The following pages outline the results of RetroKit's study on the Carrigaline SEC.

Results and Analysis

Heat Pump Readiness

‘Heat Pump Readiness’ refers to the likelihood of dwellings in the scenario having a suitably low heat loss indicator (2.0 or less, or below 2.3 in certain cases) so that a heat pump can perform effectively in the dwelling. A suitably low heat loss indicator is also needed if seeking grant funding for heat pumps. A dwelling should have additional fabric or airtightness measures applied if a heat pump is to be installed and if it isn't heat pump ready.

As per the Figure 9 below, 14% of residences in Carrigaline SEC are Heat Pump ready. However, this figure jumps to 54% under the ‘Shallow fabric’ scenario, meaning a significant proportion of homes in the community would only require a moderate amount of investment to be Heat Pump ready.

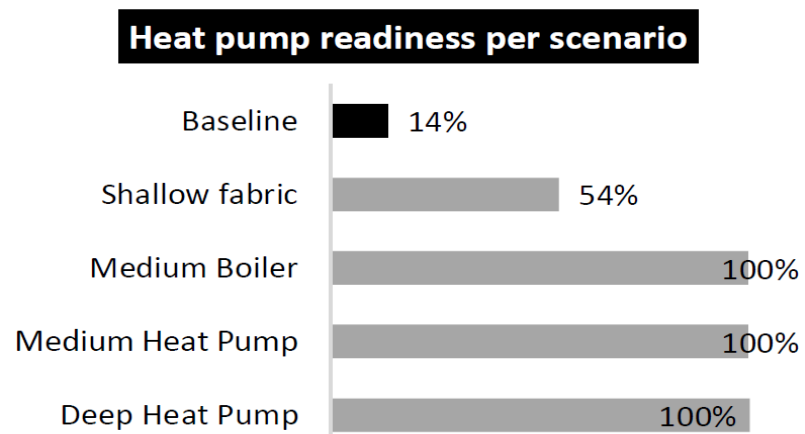


Figure 9 – Heat pump readiness under each RetroKit scenario for SEC. Please note Baseline conditions refer to today’s conditions. (RetroKit, 2022)

Reduction in Final Energy Use

Reduction in final energy use shows how far 'energy usage' is reduced compared to the baseline if the upgrades associated with each scenario were implemented into every home in the Carrigaline SEC.

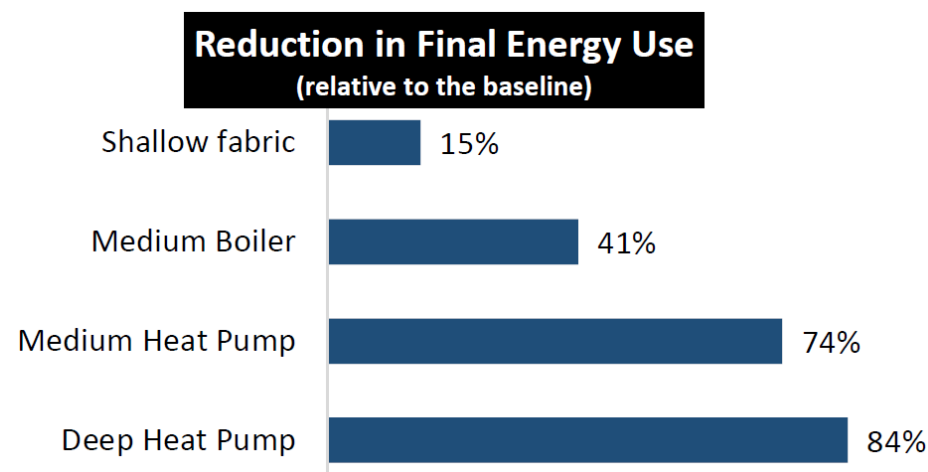


Figure 10 – Reduction in Final Energy Use compared to baseline data in the SEC (RetroKit, 2022)

As can be seen from Figure 10 above, significant reductions in energy use across the SEC can be achieved under the Medium (boiler) scenario, but particularly in the two Heat Pump scenarios. This is in alignment with the Irish Government’s Climate Action Plan and the country’s long-term goal of reaching net-zero emissions by 2050.

Carrigaline SEC Energy Master Plan

Total Annual Energy Savings

Naturally, reductions in energy usage will correspond to a decrease in energy costs for the community. The total annual energy savings graph evidences the fuel cost savings per scenario, broken down by the age bands of dwellings in the SEC. As the below graph shows, the Carrigaline SEC could save anywhere between €1.7 million - €5.2 million annually depending on which of the fabric upgrade scenarios were adopted by the community. Please note the cost savings associated with 2011-2021 homes are minimal (<€22k), therefore they are barely noticeable in the figure.

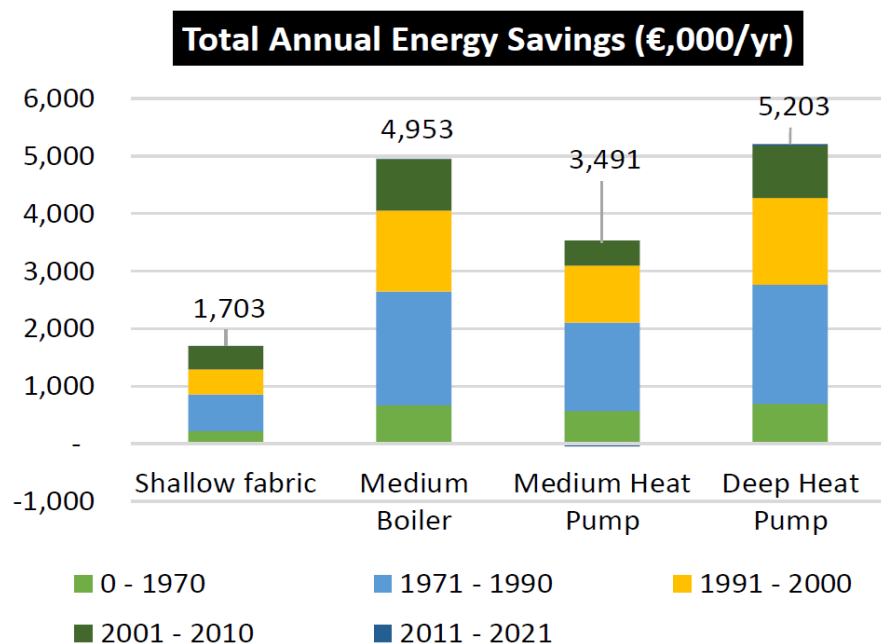


Figure 11 – Total Annual Energy Savings in millions of Euros per year versus baseline conditions if each scenario was adopted by the SEC. Please note Baseline conditions refer to today’s energy prices (RetroKit, 2022)

Energy Cost per dwelling

On an individual homeowner level, the fuel costs arising from energy usage show significant reductions on an annual basis, with the potential to save almost €1000 annually if implementing upgrades in their home that align with the Deep (Heat Pump) scenario.

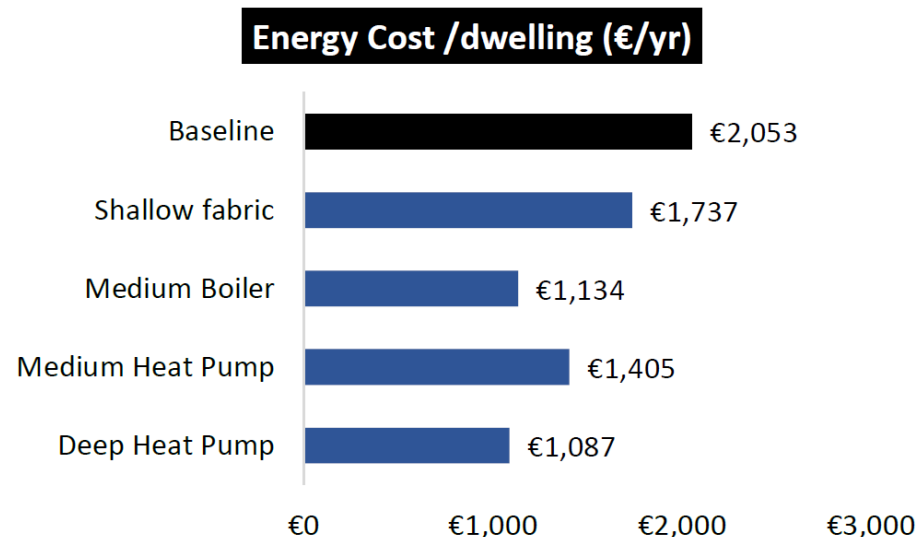


Figure 12 – The average annual energy cost per dwelling under each of the four scenarios (RetroKit, 2022)

As energy costs continue to rise, it is quite likely that the potential savings for both individual homeowners and the community as a whole would also increase under the four scenarios above. It would be hoped that this would create both a more environmentally and economically sustainable community.

RetroKit Case Studies

From the BER Research tool, RetroKit creates a set of “typical” archetype dwellings (up to 240 archetypes in total). The archetypes are classified based on 5 age bands, 4 dwelling types, 4 main space heating fuels and 3 main external wall types.

RetroKit then determines how many of each of the archetype dwellings are in the SEC. The CSO Small Area data is utilised to determine how many dwellings are in the study area as well as the percentage of these dwellings in each age band and fuel type.

As neither the CSO or BER small area data detail exactly how many dwellings are in each of the 240 archetypes, RetroKit uses the percentage of dwellings in each age band, each dwelling type, each fuel type and each wall type to determine the spread of dwellings across the 240 archetypes.

The software then deduces the most common property types in the community based on their percentage spread across the study area. This provides most homeowners across the community with a case study very similar to their own dwelling.

RetroKit select the archetypes for the case studies based on a number factors; age band, fuel type, wall type, house type and sample factor. This gives a fair spread of the different kinds of dwellings in the SEC area.

Table 8 – Carrigaline SEC RetroKit dwelling selection (RetroKit, 2022)

Age Band	Dwelling Type	Main fuel type	Main wall type
1991 - 2000	Semi-detached house	Gas or Liquid Petroleum Gas	Cavity
1971 - 1990	Semi-detached house	Gas or Liquid Petroleum Gas	Cavity
1991 - 2000	Detached house	Gas or Liquid Petroleum Gas	Cavity
1971 - 1990	Detached house	Heating Oil	Cavity
2001 - 2010	Terraced house	Gas or Liquid Petroleum Gas	Cavity
1971 - 1990	Semi-detached house	Gas or Liquid Petroleum Gas	Solid or hollow
<1971	Detached house	Heating oil	Solid or hollow

In the case of the Carrigaline SEC, seven common property types were selected, the reports for which are displayed in the rest of the document.

Carrigaline SEC Energy Master Plan

The following pages contain all 7 of RetroKits housing upgrade plans below for the Carrigaline SEC. The report uses a colour coding scheme to rate the thermal performance of the home and its systems.

Red represents poor, orange adequate and green is good. This is similar to the colour coding in the new BER advisory report. This colour coding is used for baseline, (existing) performance of the dwelling and for each upgrade package.

Comfort is defined using the heat loss indicator, (HLI) which is a measure of how well insulated and draught free the building is. The comfort colour coding also gives an indication of heat pump readiness. Green is heat pump ready, orange is likely heat pump ready, and red is not heat pump ready.

Roofs, external walls, windows, doors and floors are colour coded based on thermal performance and derived from the u-value. ⁴ Draughts are colour coded on the rate of air leakage from the building as calculated in BERs.

Main heating, water heating and secondary heating are colour coded based on efficiency of the heat source.

⁴ The rate of transfer of heat through a structure (which can be a single material or a composite), divided by the difference in temperature across that structure. The units of measurement are W/m²K. The better-insulated a structure is, the lower the U-value will be.

Heating control is based on the space heating system control category as calculated in BERs, lighting is based on the percentage of low energy fittings and ventilation's rating is based on the type of ventilation system and number of open chimneys.

Carrigaline SEC Energy Master Plan

Case Study 1 – 1991-2000, Semi-detached house with gas heating and cavity walls

Housing Upgrade Plan



Rural

Semi-d house

106m2

Built:1997

Gas or LPG



Your home energy upgrade will give you

More comfort

Money saved

Healthier home

Warmer home

Better for our planet



How you can achieve this

	Current	Shallow fabric	Medium boiler	Medium Heat Pump	Deep Heat Pump
BER	C2➡	C1➡	B2➡	B1➡	A2➡
Uplift					
Comfort Level					
Roof					
External Wall					
Windows					
Doors					
Floor					
Draughts					
Main Heating					
Water Heating					
Heating Controls					
Lighting					
Ventilation					

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Retrofit Planning Toolkit



Your options to achieve a more comfortable home

Shallow fabric

BER:








C1 ➔

Fuel Bills:

↓ €-242/yr

Environmental Impact:

↓ -1164 kgs CO₂/yr

	Cost	Impact
 Fit low energy lighting throughout property	€119	★ ☆ ☆
 Top up attic insulation to 400mm	€1586	★ ★ ☆
 Draught proofing - windows, doors and attic hatch	€362	★ ★ ★
 Fit chimney draught excluder	€178	★ ★ ☆
 Change open fire for high efficiency wood stove	€4052	★ ★ ★
 Energy credits	€0	
 Potential grants	€1300	
Total investment	€4998	

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Your options to achieve a more comfortable home

Medium boiler

BER:











B2 →

Fuel Bills:

↓ €-628/yr

Environmental Impact:

↓ -2095 kgs CO₂/yr

	Cost	Impact
 400mm Attic Insulation on Ceiling	€3052	★ ☆ ☆
 Deep Draught Proofing	€1429	★ ★ ☆
 Replace Windows with Double Glazed	€6963	★ ★ ☆
 Replace Door	€1983	★ ☆ ☆
 Fit Mechanical Demand Control Ventilation	€4088	☆ ☆ ☆
 New Condensing Gas System Boiler Including Controls	€3144	★ ★ ★
 Fit Low Energy Lighting	€137	★ ☆ ☆
 Change open fire for high efficiency wood stove	€4052	★ ★ ☆
 Energy credits	€0	
 Potential grants	€2000	
Total investment	€22851	

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Your options to achieve a more comfortable home

Medium Heat Pump

BER:

B1 ➔

Fuel Bills:

↓ €-381/yr

Environmental Impact:

↓ -2602 kgs CO₂/yr

	Cost	Impact
400mm Attic Insulation on Ceiling	€3052	★ ☆ ☆
Deep Draught Proofing	€1429	★ ☆ ☆
Replace Windows with Double Glazed	€6963	★ ☆ ☆
Replace Door	€1983	★ ☆ ☆
Fit Mechanical Demand Control Ventilation	€4088	☆ ☆ ☆
Air to Water Heat Pump, New Cylinder and Controls	€10131	★ ★ ★
Open Fire to Wood Fuel Stove	€4659	★ ☆ ☆
Change to Low Temperature Radiators	€4280	★ ☆ ☆
Fit Low Energy Lighting	€137	★ ☆ ☆
Energy credits	€0	
Potential grants	€18100	
Total investment	€18627	

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Your options to achieve a more comfortable home

Deep Heat Pump

BER:

A2➔

Fuel Bills:

↓ €-703/yr

Environmental Impact:

↓ -3379 kgs CO₂/yr

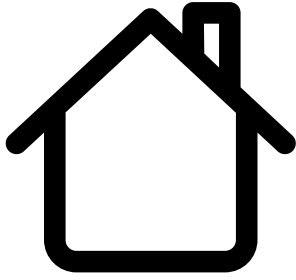
	Cost	Impact
400mm Attic Insulation on Ceiling	€3052	★ ☆ ☆
Deep Draught Proofing	€1429	★ ☆ ☆
Replace Windows with Triple Glazed	€8575	★ ☆ ☆
Replace Door	€1983	★ ☆ ☆
Fit Mechanical Ventilation with Heat Recovery	€6835	★ ☆ ☆
Air to Water Heat Pump, New Cylinder and Controls	€10131	★ ★ ★
Open Fire to Wood Fuel Stove	€4659	★ ☆ ☆
Change to Low Temperature Radiators	€4280	★ ☆ ☆
Fit Low Energy Lighting	€137	★ ☆ ☆
Install 2kWp Solar Panels	€6592	★ ☆ ☆
Energy credits	€0	
Potential grants	€19900	
Total investment	€27778	

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Carrigaline SEC Energy Master Plan

Case Study 2 – 1971-1990, Semidetached house with gas heating and cavity walls

Housing Upgrade Plan



Rural

Semi-d house

109m²

Built:1983

Gas or LPG



Your home energy upgrade will give you

More comfort

Money saved

Healthier home

Warmer home

Better for our planet



How you can achieve this

	Current	Shallow fabric	Medium Boiler	Medium Heat Pump	Deep Heat Pump
➤ BER	C3 ➤	C1 ➤	B2 ➤	B1 ➤	A2 ➤
Comfort Level					
Roof					
External Wall					
Windows					
Doors					
Floor					
Draughts					
Main Heating					
Water Heating					
Heating Controls					
Lighting					
Ventilation					

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Your options to achieve a more comfortable home

Shallow fabric

BER:

C1 ➔

Fuel Bills:

↓ €-353/yr

Environmental Impact:

↓ -1497 kgs CO₂/yr

	Cost	Impact
Fit low energy lighting throughout property	€119	★ ☆ ☆
Cavity wall insulation to partially filled cavity	€1342	★ ★ ★
Top up attic insulation to 400mm	€1668	★ ★ ☆
Draught proofing - windows, doors and attic hatch	€371	★ ★ ☆
Fit chimney draught excluder	€178	★ ★ ☆
Change open fire for high efficiency wood stove	€4052	★ ★ ★
Energy credits	€0	
Potential grants	€2500	
Total investment	€5232	

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Your next 5 easy steps to a more comfortable home



Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Medium Boiler

BER:













B2 →

Fuel Bills:

↓ **€-839/yr**

Environmental Impact:

↓ **-2637 kgs CO₂/yr**

	Cost	Impact
 Cavity and external wall insulation. Target U-value is 0.16	€23271	★ ★ ☆
 400mm attic insulation at ceiling level. Add to existing insulation where present.	€3259	★ ☆ ☆
 Draught proofing - full fabric sealing	€1456	★ ☆ ☆
 Replace windows with double glazed windows	€7912	★ ★ ☆
 Replace door with highly insulated door	€1890	★ ☆ ☆
 Fit mechanical 'demand control' ventilation	€4088	☆ ☆ ☆
 New condensing gas 'system' boiler (incl. controls)	€3144	★ ★ ★
 Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
 Replace hot water cylinder with new factory insulated model	€1373	★ ☆ ☆
 Fit low energy lighting throughout property	€137	★ ☆ ☆
 Energy credits	€0	
 Potential grants	€14300	
Total investment	€36894	

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Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Medium Heat Pump

BER:













B1 →

Fuel Bills:

↓ **€-589/yr**

Environmental Impact:

↓ **-3108 kgs CO₂/yr**

	Cost	Impact
 Cavity and external wall insulation. Target U-value is 0.16	€23271	★ ☆ ☆
 400mm attic insulation at ceiling level. Add to existing insulation where present.	€3259	★ ☆ ☆
 Draught proofing - full fabric sealing	€1456	★ ☆ ☆
 Replace windows with double glazed windows	€7912	★ ☆ ☆
 Replace door with highly insulated door	€1890	★ ☆ ☆
 Fit mechanical 'demand control' ventilation	€4088	☆ ☆ ☆
 Install air to water heat pump, new cylinder and controls	€10131	★ ★ ★
 Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
 Change existing rads to low temperature radiators	€4280	★ ☆ ☆
 Fit low energy lighting throughout property	€137	★ ☆ ☆
 Energy credits	€0	
 Potential grants	€22100	
Total investment	€38989	

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Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Deep Heat Pump

BER:














A2 →

Fuel Bills:

↓ **€-914/yr**

Environmental Impact:

↓ **-3887 kgs CO₂/yr**

	Cost	Impact
 Cavity and external wall insulation. Target U-value is 0.16	€23271	★ ☆ ☆
 400mm attic insulation at ceiling level. Add to existing insulation where present.	€3259	★ ☆ ☆
 Draught proofing - full fabric sealing	€1456	★ ☆ ☆
 Replace windows with triple glazed windows	€9744	★ ☆ ☆
 Replace door with highly insulated door	€1890	★ ☆ ☆
 Fit mechanical ventilation with heat recovery	€6835	★ ☆ ☆
 Install air to water heat pump, new cylinder and controls	€10131	★ ★ ★
 Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
 Change existing rads to low temperature radiators	€4280	★ ☆ ☆
 Fit low energy lighting throughout property	€137	★ ☆ ☆
 Install 2kWp solar electric panels	€6592	★ ☆ ☆
 Energy credits	€0	
 Potential grants	€23900	
Total investment	€48359	

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Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade

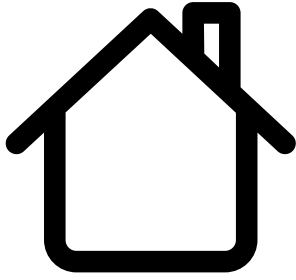


Get a warmer home

Carrigaline SEC Energy Master Plan

Case Study 3 – 1991-2000, Detached house with gas heating and cavity walls

Housing Upgrade Plan



Rural

Detached house

147m²

Built:1997

Gas or LPG



Your home energy upgrade will give you

More comfort

Money saved

Healthier home

Warmer home

Better for our planet



How you can achieve this

	Current	Shallow fabric	Medium Boiler	Medium Heat Pump	Deep Heat Pump
BER	C2	C1	B2	B1	A3
Comfort Level					
Roof					
External Wall					
Windows					
Doors					
Floor					
Draughts					
Main Heating					
Water Heating					
Heating Controls					
Lighting					
Ventilation					



Your options to achieve a more comfortable home

Shallow fabric

BER:

C1 ➔

Fuel Bills:

↓ €-310/yr

Environmental Impact:

↓ -996 kgs CO₂/yr

	Cost	Impact
 Fit low energy lighting throughout property	€119	★ ☆ ☆
 Top up attic insulation to 400mm	€2174	★ ★ ☆
 Draught proofing - windows, doors and attic hatch	€499	★ ★ ☆
 Fit chimney draught excluder	€178	★ ★ ☆
 Change open fire for high efficiency wood stove	€4052	★ ★ ★
 Energy credits	€0	
 Potential grants	€1500	
Total investment	€5524	

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Retrofit Planning Toolkit



Your next 5 easy steps to a more comfortable home



Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Medium Boiler

BER:

B2 →

Fuel Bills:

↓ **€-815/yr**

Environmental Impact:

↓ **-2206 kgs CO₂/yr**

	Cost	Impact
400mm attic insulation at ceiling level. Add to existing insulation where present.	€4534	★ ☆ ☆
Draught proofing - full fabric sealing	€1817	★ ☆ ☆
Replace windows with double glazed windows	€10439	★ ★ ☆
Replace door with highly insulated door	€2233	★ ☆ ☆
Fit mechanical 'demand control' ventilation	€4088	☆ ☆ ☆
New condensing gas 'system' boiler (incl. controls)	€3144	★ ★ ★
Change open fire for high efficiency wood fuel stove	€4659	★ ★ ☆
Fit low energy lighting throughout property	€137	★ ☆ ☆
Energy credits	€0	
Potential grants	€9500	
Total investment	€21555	

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Your next 5 easy steps to a more comfortable home



Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Medium Heat Pump

BER:

B1 →

Fuel Bills:

↓ **€-516/yr**

Environmental Impact:

↓ **-2974 kgs CO₂/yr**

	Cost	Impact
400mm attic insulation at ceiling level. Add to existing insulation where present.	€4534	★ ☆ ☆
Draught proofing - full fabric sealing	€1817	★ ☆ ☆
Replace windows with double glazed windows	€10439	★ ☆ ☆
Replace door with highly insulated door	€2233	★ ☆ ☆
Fit mechanical 'demand control' ventilation	€4088	☆ ☆ ☆
Install air to water heat pump, new cylinder and controls	€10131	★ ★ ★
Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
Change existing rads to low temperature radiators	€4280	★ ☆ ☆
Fit low energy lighting throughout property	€137	★ ☆ ☆
Energy credits	€0	
Potential grants	€17300	
Total investment	€25023	

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Your options to achieve a more comfortable home

Deep Heat Pump

BER:

A3 ➔

Fuel Bills:

↓ **€-855/yr**

Environmental Impact:

↓ **-3767 kgs CO₂/yr**

	Cost	Impact
400mm attic insulation at ceiling level. Add to existing insulation where present.	€4534	★ ☆ ☆
Draught proofing - full fabric sealing	€1817	★ ☆ ☆
Replace windows with triple glazed windows	€12854	★ ☆ ☆
Replace door with highly insulated door	€2233	★ ☆ ☆
Fit mechanical ventilation with heat recovery	€6835	★ ☆ ☆
Install air to water heat pump, new cylinder and controls	€10131	★ ★ ★
Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
Change existing rads to low temperature radiators	€4280	★ ☆ ☆
Fit low energy lighting throughout property	€137	★ ☆ ☆
Install 2kWp solar electric panels	€6592	★ ☆ ☆
Energy credits	€0	
Potential grants	€19100	
Total investment	€34978	

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Complete upgrade

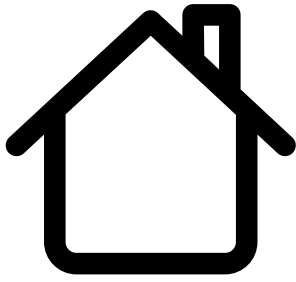


Get a warmer home

Carrigaline SEC Energy Master Plan

Case Study 4 – 1971-1990, Detached house with oil heating and cavity walls

Housing Upgrade Plan



Rural

Detached house

150m²

Built:1981

Heating oil



Your home energy upgrade will give you

More comfort

Money saved

Healthier home

Warmer home

Better for our planet



How you can achieve this

	Current	Shallow fabric	Medium Boiler (oil)	Medium Heat Pump	Deep Heat Pump
➤ BER	C3 ➤	C2 ➤	B2 ➤	B1 ➤	A3 ➤
Comfort Level					
Roof					
External Wall					
Windows					
Doors					
Floor					
Draughts					
Main Heating					
Water Heating					
Heating Controls					
Lighting					
Ventilation					



Your options to achieve a more comfortable home

Shallow fabric

BER:

C2

Fuel Bills:

€-556/yr

Environmental Impact:

-2133 kgs CO₂/yr

	Cost	Impact
Fit low energy lighting throughout property	€119	★ ☆ ☆
Cavity wall insulation to partially filled cavity	€1754	★ ★ ★
Top up attic insulation to 400mm	€2651	★ ★ ★
Draught proofing - windows, doors and attic hatch	€508	★ ★ ☆
Fit chimney draught excluder	€178	★ ☆ ☆
Change open fire for high efficiency wood stove	€4052	★ ★ ★
Energy credits	€0	
Potential grants	€3200	
Total investment	€6066	

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Your next 5 easy steps to a more comfortable home



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Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Medium Boiler (oil)

BER:












B2 →

Fuel Bills:

↓ **€-1633/yr**

Environmental Impact:

↓ **-4445 kgs CO₂/yr**

	Cost	Impact
 Cavity and external wall insulation. Target U-value is 0.16	€30435	★ ★ ☆
 400mm attic insulation at ceiling level. Add to existing insulation where present.	€5739	★ ☆ ☆
 Draught proofing - full fabric sealing	€1843	★ ☆ ☆
 Replace windows with double glazed windows	€11731	★ ★ ☆
 Replace door with highly insulated door	€2069	★ ☆ ☆
 Fit mechanical 'demand control' ventilation	€4088	☆ ☆ ☆
 New condensing oil boiler (incl. controls)	€4034	★ ★ ★
 Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
 Fit low energy lighting throughout property	€137	★ ☆ ☆
 Energy credits	€0	
 Potential grants	€17500	
Total investment	€47240	

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Your next 5 easy steps to a more comfortable home



Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Medium Heat Pump

BER:













B1 →

Fuel Bills:

↓ **€-1794/yr**

Environmental Impact:

↓ **-6047 kgs CO₂/yr**

	Cost	Impact
 Cavity and external wall insulation. Target U-value is 0.16	€30435	★ ☆ ☆
 400mm attic insulation at ceiling level. Add to existing insulation where present.	€5739	★ ☆ ☆
 Draught proofing - full fabric sealing	€1843	★ ☆ ☆
 Replace windows with double glazed windows	€11731	★ ☆ ☆
 Replace door with highly insulated door	€2069	★ ☆ ☆
 Fit mechanical 'demand control' ventilation	€4088	☆ ☆ ☆
 Install air to water heat pump, new cylinder and controls	€10131	★ ★ ★
 Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
 Change existing rads to low temperature radiators	€4280	★ ☆ ☆
 Fit low energy lighting throughout property	€137	★ ☆ ☆
 Energy credits	€0	
 Potential grants	€25300	
Total investment	€49819	

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Your next 5 easy steps to a more comfortable home



Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Deep Heat Pump

BER:

A3 →

Fuel Bills:

↓ **€-2138/yr**

Environmental Impact:

↓ **-6844 kgs CO₂/yr**

	Cost	Impact
Cavity and external wall insulation. Target U-value is 0.16	€30435	★ ☆ ☆
400mm attic insulation at ceiling level. Add to existing insulation where present.	€5739	★ ☆ ☆
Draught proofing - full fabric sealing	€1843	★ ☆ ☆
Replace windows with triple glazed windows	€14446	★ ☆ ☆
Replace door with highly insulated door	€2069	★ ☆ ☆
Fit mechanical ventilation with heat recovery	€6835	★ ☆ ☆
Install air to water heat pump, new cylinder and controls	€10131	★ ★ ★
Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
Change existing rads to low temperature radiators	€4280	★ ☆ ☆
Fit low energy lighting throughout property	€137	★ ☆ ☆
Install 2kWp solar electric panels	€6592	★ ☆ ☆
Energy credits	€0	
Potential grants	€27100	
Total investment	€60072	

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Your next 5 easy steps to a more comfortable home



Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade

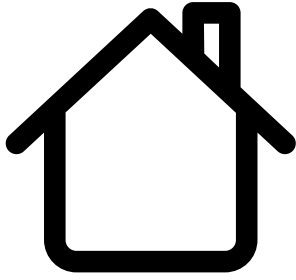


Get a warmer home

Carrigaline SEC Energy Master Plan

Case Study 5 – 2001-2010, Terraced house with gas heating and cavity walls

Housing Upgrade Plan



Rural

Terraced house

95m²

Built:2005

Gas or LPG



Your home energy upgrade will give you

More comfort

Money saved

Healthier home

Warmer home

Better for our planet



How you can achieve this

	Current	Shallow fabric	Medium Boiler	Medium Heat Pump	Deep Heat Pump
➤ BER	B3➤	B3➤	B2➤	B1➤	A2➤
Comfort Level					
Roof					
External Wall					
Windows					
Doors					
Floor					
Draughts					
Main Heating					
Water Heating					
Heating Controls					
Lighting					
Ventilation					

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Your options to achieve a more comfortable home

Shallow fabric

BER:








B3 ➔

Fuel Bills:

↓ €-192/yr

Environmental Impact:

↓ -776 kgs CO₂/yr

	Cost	Impact
 Fit low energy lighting throughout property	€95	★ ☆ ☆
 Top up attic insulation to 400mm	€1422	★ ★ ☆
 Draught proofing - windows, doors and attic hatch	€322	★ ★ ★
 Fit chimney draught excluder	€178	★ ★ ☆
 Change open fire for high efficiency wood stove	€4052	★ ★ ★
 Energy credits	€0	
 Potential grants	€1200	
Total investment	€4871	

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Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Medium Boiler

BER:










B2 →

Fuel Bills:

↓ **€-306/yr**

Environmental Impact:

↓ **-1084 kgs CO₂/yr**

	Cost	Impact
 400mm attic insulation at ceiling level. Add to existing insulation where present.	€2639	★ ★ ☆
 Draught proofing - full fabric sealing	€1315	★ ★ ☆
 Replace door with highly insulated door	€1672	★ ☆ ☆
 Fit mechanical 'demand control' ventilation	€4088	☆ ☆ ☆
 New condensing gas 'system' boiler (incl. controls)	€3144	★ ★ ★
 Change open fire for high efficiency wood fuel stove	€4659	★ ★ ☆
 Fit low energy lighting throughout property	€109	★ ☆ ☆
 Energy credits	€0	
 Potential grants	€5200	
Total investment	€12432	

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Your next 5 easy steps to a more comfortable home



Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Medium Heat Pump

BER:

B1 →

Fuel Bills:

↓ **€-76/yr**

Environmental Impact:

↓ **-1497 kgs CO₂/yr**

	Cost	Impact
400mm attic insulation at ceiling level. Add to existing insulation where present.	€2639	★ ☆ ☆
Draught proofing - full fabric sealing	€1315	★ ☆ ☆
Replace door with highly insulated door	€1672	★ ☆ ☆
Fit mechanical 'demand control' ventilation	€4088	☆ ☆ ☆
Install air to water heat pump, new cylinder and controls	€10131	★ ★ ★
Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
Change existing rads to low temperature radiators	€3424	★ ☆ ☆
Fit low energy lighting throughout property	€109	★ ☆ ☆
Energy credits	€0	
Potential grants	€13000	
Total investment	€15044	

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Your next 5 easy steps to a more comfortable home



Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Deep Heat Pump

BER:

A2 →

Fuel Bills:

↓ **€-371/yr**

Environmental Impact:

↓ **-2242 kgs CO₂/yr**

	Cost	Impact
400mm attic insulation at ceiling level. Add to existing insulation where present.	€2639	★ ☆ ☆
Draught proofing - full fabric sealing	€1315	★ ☆ ☆
Replace door with highly insulated door	€1672	★ ☆ ☆
Fit mechanical ventilation with heat recovery	€6835	★ ☆ ☆
Install air to water heat pump, new cylinder and controls	€10131	★ ★ ★
Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
Change existing rads to low temperature radiators	€3424	★ ☆ ☆
Fit low energy lighting throughout property	€109	★ ☆ ☆
Install 2kWp solar electric panels	€6592	★ ★ ☆
Energy credits	€0	
Potential grants	€14800	
Total investment	€22583	

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Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade

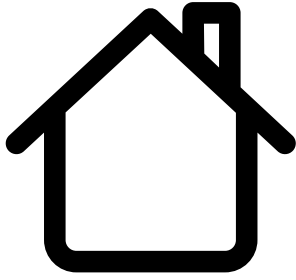


Get a warmer home

Carrigaline SEC Energy Master Plan

Case Study 6 – 1971-1990, Semi-detached house with gas heating and solid walls

Housing Upgrade Plan



Rural

Semi-d house

112m²

Built:1977

Gas or LPG



Your home energy upgrade will give you

More comfort

Money saved

Healthier home

Warmer home

Better for our planet



How you can achieve this

	Current	Shallow fabric	Medium Boiler	Medium Heat Pump	Deep Heat Pump
➤ BER	D1 ➤	C3 ➤	B2 ➤	B1 ➤	A2 ➤
Comfort Level					
Roof					
External Wall					
Windows					
Doors					
Floor					
Draughts					
Main Heating					
Water Heating					
Heating Controls					
Lighting					
Ventilation					



Your options to achieve a more comfortable home

Shallow fabric

BER:

C3

Fuel Bills:

€-315/yr

Environmental Impact:

-1646 kgs CO₂/yr

	Cost	Impact
Fit low energy lighting throughout property	€119	★ ☆ ☆
300mm Attic insulation at ceiling (from 0mm)	€1623	★ ★ ★
Draught proofing - windows, doors and attic hatch	€381	★ ★ ☆
Fit chimney draught excluder	€178	★ ☆ ☆
Change open fire for high efficiency wood stove	€4052	★ ★ ★
Energy credits	€0	
Potential grants	€1300	
Total investment	€5056	

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Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Medium Boiler

BER:













B2 →

Fuel Bills:

↓ **€-1064/yr**

Environmental Impact:

↓ **-3372 kgs CO₂/yr**

	Cost	Impact
 External wall insulation to solid wall. Target U-value is 0.27	€18949	★ ★ ★
 300mm attic insulation at ceiling level. Add to existing insulation where present.	€3120	★ ★ ☆
 Draught proofing - full fabric sealing	€1485	★ ☆ ☆
 Replace windows with double glazed windows	€9088	★ ★ ☆
 Replace door with highly insulated door	€1909	★ ☆ ☆
 Fit mechanical 'demand control' ventilation	€4088	☆ ☆ ☆
 New condensing gas 'system' boiler (incl. controls)	€3144	★ ★ ★
 Change open fire for high efficiency wood fuel stove	€4659	★ ★ ☆
 Replace hot water cylinder with new factory insulated model	€1373	★ ☆ ☆
 Fit low energy lighting throughout property	€137	★ ☆ ☆
 Energy credits	€0	
 Potential grants	€14300	
Total investment	€33658	

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Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Medium Heat Pump

BER:













B1 →

Fuel Bills:

↓ **€-809/yr**

Environmental Impact:

↓ **-3912 kgs CO₂/yr**

	Cost	Impact
 External wall insulation to solid wall. Target U-value is 0.27	€18949	★ ★ ☆
 300mm attic insulation at ceiling level. Add to existing insulation where present.	€3120	★ ☆ ☆
 Draught proofing - full fabric sealing	€1485	★ ☆ ☆
 Replace windows with double glazed windows	€9088	★ ☆ ☆
 Replace door with highly insulated door	€1909	★ ☆ ☆
 Fit mechanical 'demand control' ventilation	€4088	☆ ☆ ☆
 Install air to water heat pump, new cylinder and controls	€10131	★ ★ ★
 Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
 Change existing rads to low temperature radiators	€4280	★ ☆ ☆
 Fit low energy lighting throughout property	€137	★ ☆ ☆
 Energy credits	€0	
 Potential grants	€22100	
Total investment	€35753	

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Your next 5 easy steps to a more comfortable home



Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Deep Heat Pump

BER:

A2 →

Fuel Bills:

↓ **€-1145/yr**

Environmental Impact:

↓ **-4703 kgs CO₂/yr**

	Cost	Impact
External wall insulation to solid wall. Target U-value is 0.27	€18949	★ ★ ☆
300mm attic insulation at ceiling level. Add to existing insulation where present.	€3120	★ ☆ ☆
Draught proofing - full fabric sealing	€1485	★ ☆ ☆
Replace windows with triple glazed windows	€11191	★ ☆ ☆
Replace door with highly insulated door	€1909	★ ☆ ☆
Fit mechanical ventilation with heat recovery	€6835	★ ☆ ☆
Install air to water heat pump, new cylinder and controls	€10131	★ ★ ★
Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
Change existing rads to low temperature radiators	€4280	★ ☆ ☆
Fit low energy lighting throughout property	€137	★ ☆ ☆
Install 2kWp solar electric panels	€6592	★ ☆ ☆
Energy credits	€0	
Potential grants	€23900	
Total investment	€45395	

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Your next 5 easy steps to a more comfortable home



Arrange a home energy survey:



Get quotes for the work



Appoint a contractor

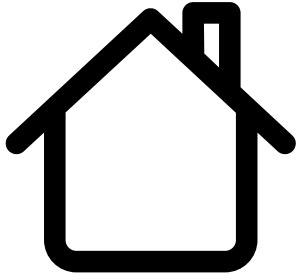


Complete upgrade



Get a warmer home

Housing Upgrade Plan



Rural

Detached house

135m²

Built:1915

Heating oil



Your home energy upgrade will give you



How you can achieve this

	Current	Shallow fabric	Medium Boiler (oil)	Medium Heat Pump	Deep Heat Pump
➔ BER	E1 ➔	D1 ➔	B2 ➔	B1 ➔	A3 ➔
Comfort Level					
Roof					
External Wall					
Windows					
Doors					
Floor					
Draughts					
Main Heating					
Water Heating					
Heating Controls					
Lighting					
Ventilation					

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Your options to achieve a more comfortable home

Shallow fabric

BER:

D1 →

Fuel Bills:

↓ €-688/yr

Environmental Impact:

↓ -2867 kgs CO₂/yr

	Cost	Impact
 Fit low energy lighting throughout property	€119	★ ☆ ☆
 300mm Attic insulation at ceiling (from 0mm)	€2027	★ ★ ★
 Draught proofing - windows, doors and attic hatch	€459	★ ☆ ☆
 Fit chimney draught excluder	€178	★ ☆ ☆
 Change open fire for high efficiency wood stove	€4052	★ ★ ☆
 Energy credits	€0	
 Potential grants	€1500	
Total investment	€5336	

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Your next 5 easy steps to a more comfortable home



Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Medium Boiler (oil)

BER:

B2 →

Fuel Bills:

↓ **€-2673/yr**

Environmental Impact:

↓ **-7068 kgs CO₂/yr**

	Cost	Impact
External wall insulation to solid wall. Target U-value is 0.27	€28410	★ ★ ★
300mm attic insulation at ceiling level. Add to existing insulation where present.	€4127	★ ★ ☆
Draught proofing - full fabric sealing	€1700	★ ☆ ☆
Replace windows with double glazed windows	€8281	★ ☆ ☆
Replace door with highly insulated door	€2188	★ ☆ ☆
Fit mechanical 'demand control' ventilation	€4088	☆ ☆ ☆
New condensing oil boiler (incl. controls)	€4034	★ ★ ★
Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
Fit low energy lighting throughout property	€137	★ ☆ ☆
Energy credits	€0	
Potential grants	€17500	
Total investment	€40129	

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Your next 5 easy steps to a more comfortable home



Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Medium Heat Pump

BER:













B1 →

Fuel Bills:

↓ **€-2840/yr**

Environmental Impact:

↓ **-8647 kgs CO₂/yr**

	Cost	Impact
 External wall insulation to solid wall. Target U-value is 0.27	€28410	★ ★ ☆
 300mm attic insulation at ceiling level. Add to existing insulation where present.	€4127	★ ☆ ☆
 Draught proofing - full fabric sealing	€1700	★ ☆ ☆
 Replace windows with double glazed windows	€8281	★ ☆ ☆
 Replace door with highly insulated door	€2188	★ ☆ ☆
 Fit mechanical 'demand control' ventilation	€4088	☆ ☆ ☆
 Install air to water heat pump, new cylinder and controls	€10131	★ ★ ★
 Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
 Change existing rads to low temperature radiators	€4280	★ ☆ ☆
 Fit low energy lighting throughout property	€137	☆ ☆ ☆
 Energy credits	€0	
 Potential grants	€25300	
Total investment	€42708	

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Sustainable Energy
Retrofit Planning Toolkit



Your next 5 easy steps to a more comfortable home



Arrange a home energy survey:



Get quotes for the work



Appoint a contractor



Complete upgrade



Get a warmer home



Your options to achieve a more comfortable home

Deep Heat Pump

BER:














A3 ➔

Fuel Bills:

↓ **€-3172/yr**

Environmental Impact:

↓ **-9431 kgs CO₂/yr**

	Cost	Impact
 External wall insulation to solid wall. Target U-value is 0.27	€28410	★ ★ ☆
 300mm attic insulation at ceiling level. Add to existing insulation where present.	€4127	★ ☆ ☆
 Draught proofing - full fabric sealing	€1700	★ ☆ ☆
 Replace windows with triple glazed windows	€10197	★ ☆ ☆
 Replace door with highly insulated door	€2188	★ ☆ ☆
 Fit mechanical ventilation with heat recovery	€6835	★ ☆ ☆
 Install air to water heat pump, new cylinder and controls	€10131	★ ★ ★
 Change open fire for high efficiency wood fuel stove	€4659	★ ☆ ☆
 Change existing rads to low temperature radiators	€4280	★ ☆ ☆
 Fit low energy lighting throughout property	€137	☆ ☆ ☆
 Install 2kWp solar electric panels	€6592	★ ☆ ☆
 Energy credits	€0	
 Potential grants	€27100	
Total investment	€52163	

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