

Your Retrofit Plan

Prepared by URBED (Urbanism Environment and Design) Ltd



Working with Carbon Coop

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Introduction

This report is based on information gathered during a survey visit to two properties in the Redbricks on 24 January 2019. A standard 'My Home Energy Planner' (MHEP) report has been prepared for both of the properties visited. This summary report provides some information, plus a commentary on the thermal images taken during the visit and some suggested basic measures that may be useful for the Redbricks as a whole.

The two graphs below show a summary of the scenarios developed for each apartment using the My Home Energy Planner tool. One apartment was a mid-floor, mid-block two bedroom apartment. The other was a three bedroom end of block apartment on the top floor - so with a larger exposed area resulting in higher heat-loss.

Using the tool we create an energy model of how each home exists now, the baseline. We then create a set of potential future scenarios in the model - applying measures such as insulation, draught-proofing and new heating systems to see what difference it might make.

In the case of both of the properties visited, the biggest area of heat loss was from draughts - or infiltration. This was evident in the model, but also in the thermal imaging that was taken as part of the survey. Tackling these draughts should make these homes more comfortable. It is something that could also be looked at across the rest of the Redbricks.

Scenario One in each case looked to improve draught-proofing, whilst also improving ventilation systems to ensure that good indoor air quality is maintained.

Scenario Two involves bigger changes. In one case replacing an old heating system. In the other replacing the existing single-glazed windows with new triple glazed windows. These works require more planning and cost more - but are very doable.

Scenario Three in each case involves major changes, primarily external wall insulation (EWI). This would only really be possible if planned across the whole block, and will be quite costly as a whole project. It would also require planning permission and careful consideration of the aesthetic effect - and we know it may not be possible anytime soon.

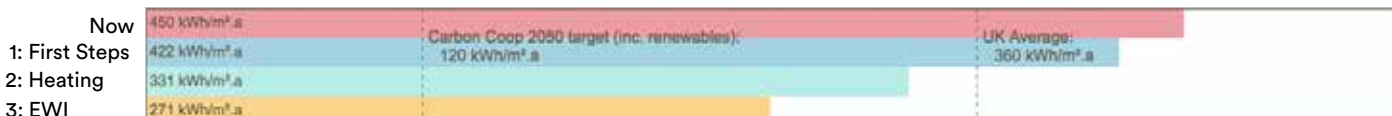
We've included it so you can see what is technically possible - with the potential to achieve very high levels of insulation and low heat losses that will significantly improve comfort and reduce fuel bills. It may be even be possible, with good detailing and processes, to approach the 'Passive House' standard or EnerPHit standard on some or all apartments. This would make the Redbricks a low carbon exemplar - though the redbricks themselves might not be visible anymore!

Scenario Summary: two bedroom mid-floor apartment

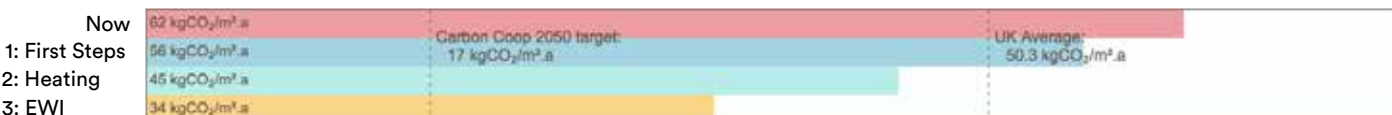
Space heating demand



Primary energy demand

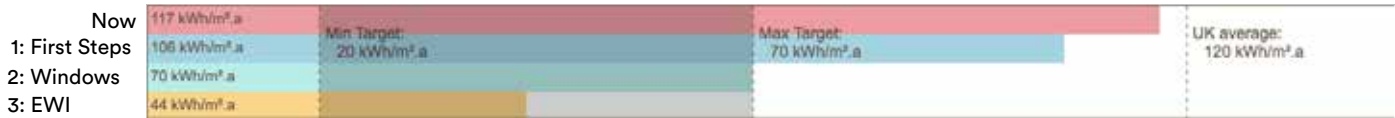


CO₂ Emission rate

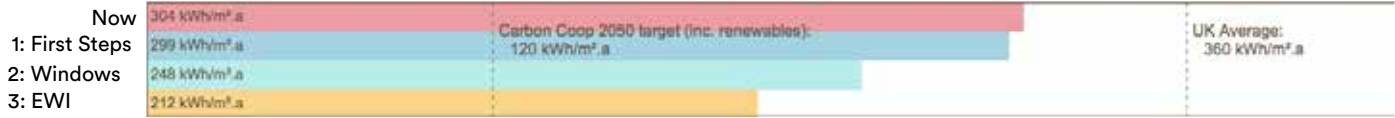


Scenario Summary: three bedroom top-floor apartment

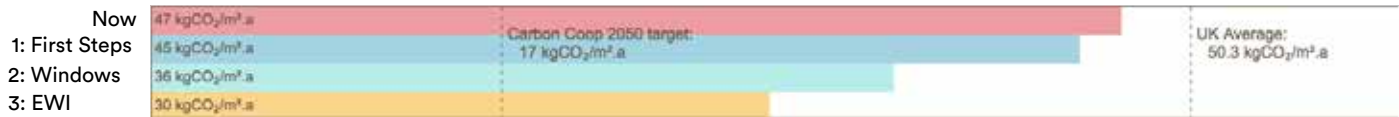
Space heating demand



Primary energy demand



CO₂ Emission rate

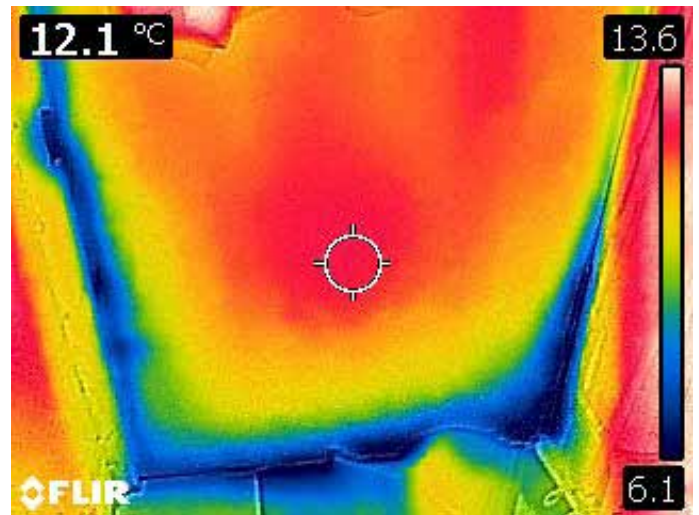


1.0: Thermal Imaging

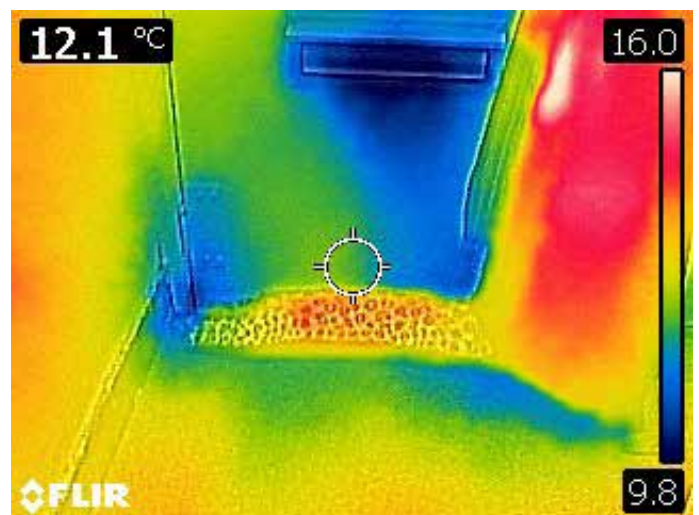
When the survey was undertaken in January 2019, the weather was cold enough to make thermal imaging useful. The images here show where heat loss was identified in the properties we visited - and that may also be present in other properties within the area.



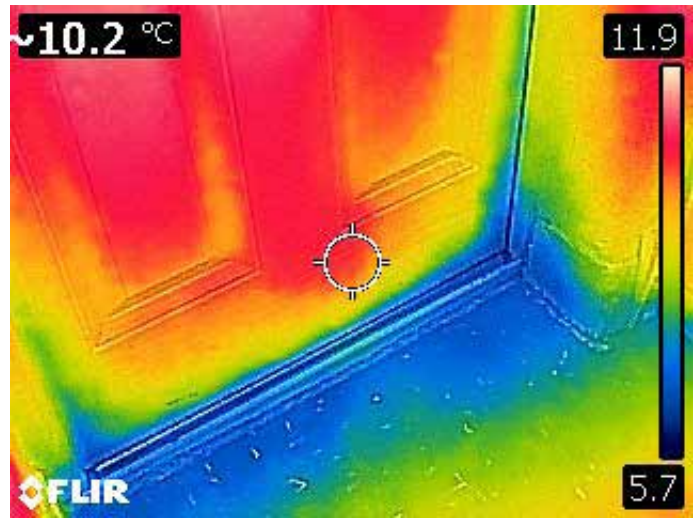
Heat-loss through single-glazed windows.



Heat-loss around external door to balcony. Improved draught-stripping here could significantly reduce this.



Heat-loss at flat entrance door threshold. A draught-excluder makes some difference here - but full draught-stripping would also help.



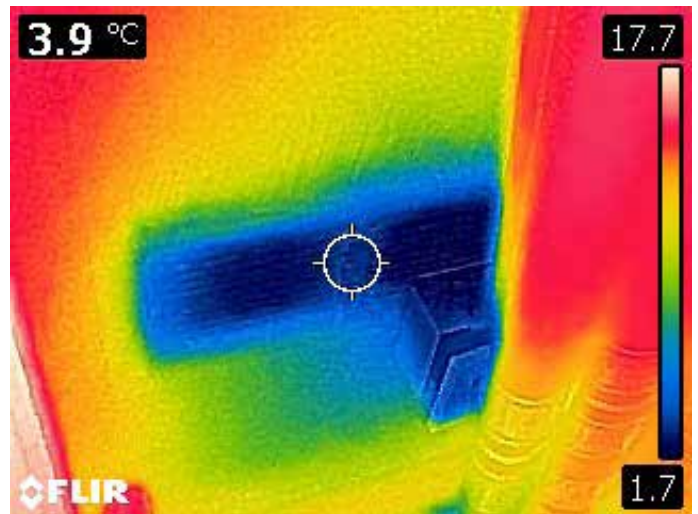
Heat-loss at flat entrance door threshold - some draught-proofing, but could be improved.



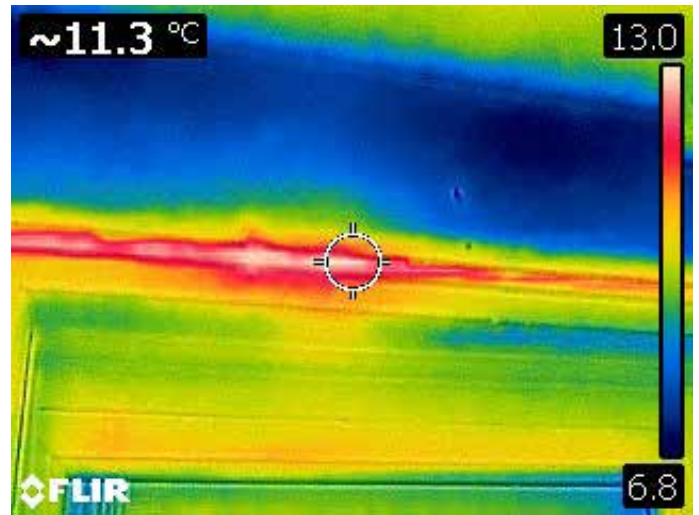
Lots of draughts and leaks are caused by poorly-sealed building services - such as around waste pipes from bathrooms. It's a relatively simple job to just seal these better.



Window trickle vents are a necessary part of the ventilation system. However, the vent in the reveal here, which is adding to heat loss, could potentially be sealed if a better ventilation system was installed - removing wet air from kitchens and bathrooms.



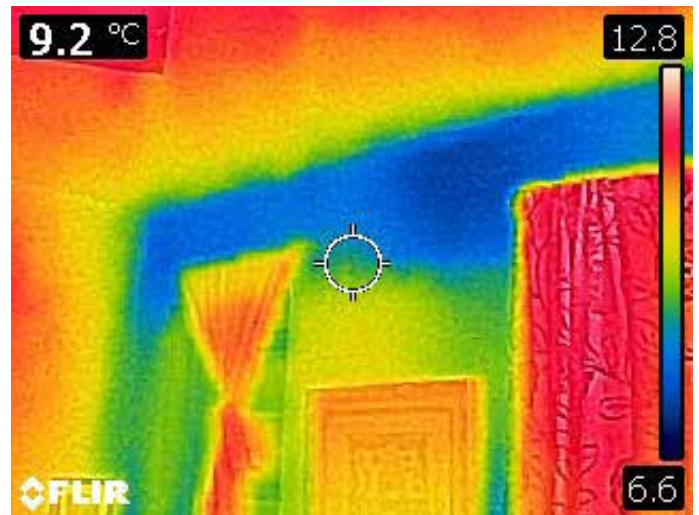
Uncontrolled wall vents are another major source of heat loss. These are sometimes needed - in particular if you have a gas fire or solid fuel burning appliance, to reduce the risk of carbon-monoxide build up. However they can and should be removed if there is no appliance and adequate ventilation is provided elsewhere.



The concrete from structure of the apartment blocks means that there are a lot of large 'thermal bridges' in the building. Where each floor meets the external wall, or where there are clearly concrete beams, these colder areas show up in the thermal imaging. The junction to the external balconies is another area of heat loss.

These remain despite the installation of cavity wall insulation - as it is likely that beams and balconies bridge the cavity.

The only way for these to be removed is through the application of external wall insulation - adding a 'tea cosy' to the whole block. However this is costly and will make a big change in the appearance of the blocks, which may not be welcomed.



2.0: Simple Measures

The table below suggests some simple measures that the residents of the Redbricks may wish to consider applying in their homes.

Item	Description	Estimated Cost
Thermal Curtains for Doors and Windows	Closing your curtains and blinds at dusk reduces heat loss. This is especially true if your windows are single glazed or not very good double glazing. Using thick thermal curtains, fixed as close to the window as possible, has the biggest effect. Fit a pelmet at the top of the curtains, or fit them tight against the ceiling, to stop heat leaking at the top of the window and make sure they fall to a window cill or the floor at the bottom. If you have a radiator below your window, make sure this isn't covered with the curtains - otherwise heat will just escape out of the window. For maximum effect, you could also velcro seal the curtains to the wall at either side, and at the centre between drapes. If you have glazed or draughty doors, thermal curtains can also help - they're not just for windows!. The cost will depend on the size of the window or door and the fabric chosen.	£35-£150
Fabric Draught Excluder	Placing a fabric draught excluder at the bottom of doors in your home can help cut down on draughts. You can even make these yourself if you can sew. The cost will depend on whether it's home-made or bought, and what materials are used. It is possible to make these very cheaply with waste and scrap materials.	£10-40 each
Radiator Panels	Where a radiator is on an external wall, a lot of the heat it emits goes into the wall and escapes to the outside. You can help reduce this effect by fitting reflective radiator panels between it and the wall, which reflect heat back into the room. Make sure the panel is set off the wall, so that heat doesn't directly enter the wall.	£20-40 for a pack of ten panels
Radiator Bleeding and Tools	Make sure you're getting the most out of your radiators by removing any trapped air in the system. This will make your radiators warmer, and your heating system more efficient. You can buy tools that help you do this manually. With some types of radiator it may be possible to add an automatic bleed valve - but you'll need one of these for each radiator	£10 each
Letter boxes	A letter box can be a major cause of draughts and heat loss. Prevent this by fitting a draught-excluding cover. Brush-type covers will prevent some draught, but solid flaps that seal shut unless post is being pushed against them are best.	£35 each
Keyhole cover	Using a small flap to cover keyholes in doors will help reduce draughts.	10

Item	Description	Estimated Cost
Open Chimneys	An open chimney above a fire place will be a major source of heat loss. When it is not being used for a fire, you should block it with a removable chimney draught excluder. These are specially made products that will help reduce draughts and keep heat in, but still allow the chimney to be vented, avoiding damp and condensation problems. They may either be inflatable 'balloons' or pillows, or made out of a vapour permeable material such as sheeps wool.	£20-50
Windows - Draughtproofing	Draught-proofing your window frames will cut down on draughts - making your home warmer and more comfortable. This is a relatively simply job, with draught-proofing strips simply glued or screwed to the existing frame. May be harder to achieve with uPVC windows - but in this case make sure the windows close firmly and potentially adjust the hinges to make sure they do.	£10 per window
Doors - Draughtproofing (basic)	Draught-proofing your door frames will cut down on draughts - making your home warmer and more comfortable. This is a relatively simply job, with draught-proofing strips simply glued or screwed to the existing frame.	£30 per door
Doors - Draughtproofing (advanced)	For timber doors over 40mm thick, it is possible to add an additional timber rebate to the door, making the route for escaping air harder, by cutting a square section out of the door jamb, and planting a corresponding square bead on the door frame, as well as rubber draught-proofing strips. This will improve the draught-proofing of the door.	£150 per door
Floors - draughtproofing	Floors can be a major source of draughts and heat loss. Pay particular attention to skirting boards and floor edges, filling any gaps and sealing with air-seal tape if possible. If you have a cellar and can get below the floor, you can also seal the floor from below with tapes and even air-seal membranes. The cost will depend on the level of work done - with lifting the floor and sealing with tapes and membranes being most expensive. This applies to exposed upper floors - above porches and in overhangs - as much as it does to ground floors.	£20-150 for gap fill. More for membranes and tapes.
Carbon Monoxide Monitor	Carbon Monoxide is a dangerous gas which can make you ill and even kill you if it reaches a high concentration in you home. Make sure you have a carbon monoxide monitor to alert you to this. This is especially important if you have a fuel burning appliance, like a gas fire, gas boiler or woodburner.	£20
Temperature and Humidity Monitor	Ideally the temperature in your home should be above 16 degrees, and relative humidity should be between 40% and 60% to ensure good indoor air quality and health. If you have a temperature and humidity monitor, you can keep track of this.	£20
Extract Ventilation	Fitting an energy efficient low-level continuously running extract to your bathroom and kitchen will help maintain good indoor air quality by removing moisture and polluted air. This is known as decentralised mechanical extract ventilation - and will improve air quality when compared with intermittent extract, which only comes on sporadically.	approx £150 per fan installed

Item	Description	Estimated Cost
Clothes Drying - Indoors	Clothes drying adds a significant amount of moisture to the air, which can drive up internal humidity causing issues with condensation and damp. Making sure that if you have to dry your clothes inside you do it somewhere that is well ventilated and warm will help reduce this risk. An old-fashioned ceiling-mounted airer located near extract ventilation or an opening rooflight, or shelves within an airing cupboard, would both help with this. If this is not possible, then drying clothes near an open window should help. If you have a lot of laundry and limited space, you could consider using an energy efficient electric clothes drier. This won't save you energy, but it will help improve the air quality in your home.	varies
Clothes Drying - Outdoors	When the weather is fine, if you have outdoor space, it is best to dry your clothes outside - on a balcony, in yard or in a garden. Investing in a collapsible clothes airer for this will maximise the use of space and keep things looking neat.	£50
Hot water saving - Water efficient shower head	By reducing the amount of hot water you use, you will also save energy as less will be needed to heat the water. If you regularly use a shower, fitting a low-flow or aerating shower head will help you achieve this - they can cut down the amount of water required by 30-50%, without adversely affecting the performance. How much you save overall will depend on how much you shower.	£30-50 each
Boiler Controls - Central Heating	Make sure the controls for central heating on your boiler are optimised. You may be able to reduce the temperature of the water supplied to your radiators and still be warm, especially in spring and autumn. This will help your boiler run more efficiently. If your boiler has a timer on it, you can use this to control when the heating comes on. You can experiment with this until you reach a setting that works well for you and how you live in your home - whether you're there all the time or not - especially if you are able to monitor your real-time energy use at the same time (see below).	no cost
Thermostatic radiator valves TRVs (Programmable)	If you have central heating with radiators, you can control the amount of heat provided by each radiator by using Thermostatic Radiator Valves (TRVs). This means you can turn the heating down in rooms you don't use as much, or don't mind being a bit cooler, (like bedrooms), whilst still having enough heat in the rooms you want it. These can be simple manual controls which you simply turn to the level setting you want, though programmable digital versions are also now available, so you can set each individual radiator to different temperatures at different times.	£10-50 each
Room thermostat and programmer	If you have central heating, a room thermostat allows you to control the temperature of your home - making sure it reaches the temperature you need it to and no more, so no energy is wasted. Including a programmer with this means you can also control what time your heating comes. Contrary to common myth, it is much more efficient to just have the heating on when you need it than to have it on all the time at a low level. A room thermostat and programmer allows you to have more control over this and find a pattern of heating that suits you.	£150-200

Item	Description	Estimated Cost
Pipe insulation	Insulating pipework means that you don't waste heat, losing it where you don't need it. It's especially important to make sure any pipework between your boiler or other heat source and your hot water cylinder is insulated. Insulated pipework that travels through any colder spaces - like utility rooms or underfloor spaces - will also help you keep the heat where you need it most.	£20-50 approx
Cylinder insulation	If you have a hot water cylinder, make sure it is well insulated so you don't waste heat from the stored water. If it doesn't come factory-fitted with insulation, it's possible to add insulation with a simple 'jacket'. This will help keep the heat where you want it.	£20-50 approx
Energy monitor	An energy monitor will help you keep a track of the energy use. If it also tracks your heating energy use, it will help you work out the heating pattern that works best for you for comfort and energy saving.	£50-100
Lighting	Making sure that all of your light-bulbs are energy efficient - either LEDs, compact fluorescent or tube fluorescents - will save energy and money. These are available from most standard retailers, to fit most types of light fitting.	£2-10 per bulb.
Masterswitches	Masterswitches are extension leads that allow you to switch off multiple appliances at once. They're a good way of making sure that you don't leave unused appliances on when you don't need them, like TVs and computers with printers and scanners. If you are already very good at switching things off when you don't need them, this probably won't save you very much.	£20
A+++ Appliances	Making sure that your appliances are as energy efficient as possible when you come to replace them will help save energy and money. Newer A+++ fridges, freezers, washing machines and dishwashers are much more efficient than those over 5 years old - though it's still a good idea to use an appliance until it wears out before replacing it.	varies

