



A Whistle Stop Tour to Retrofit

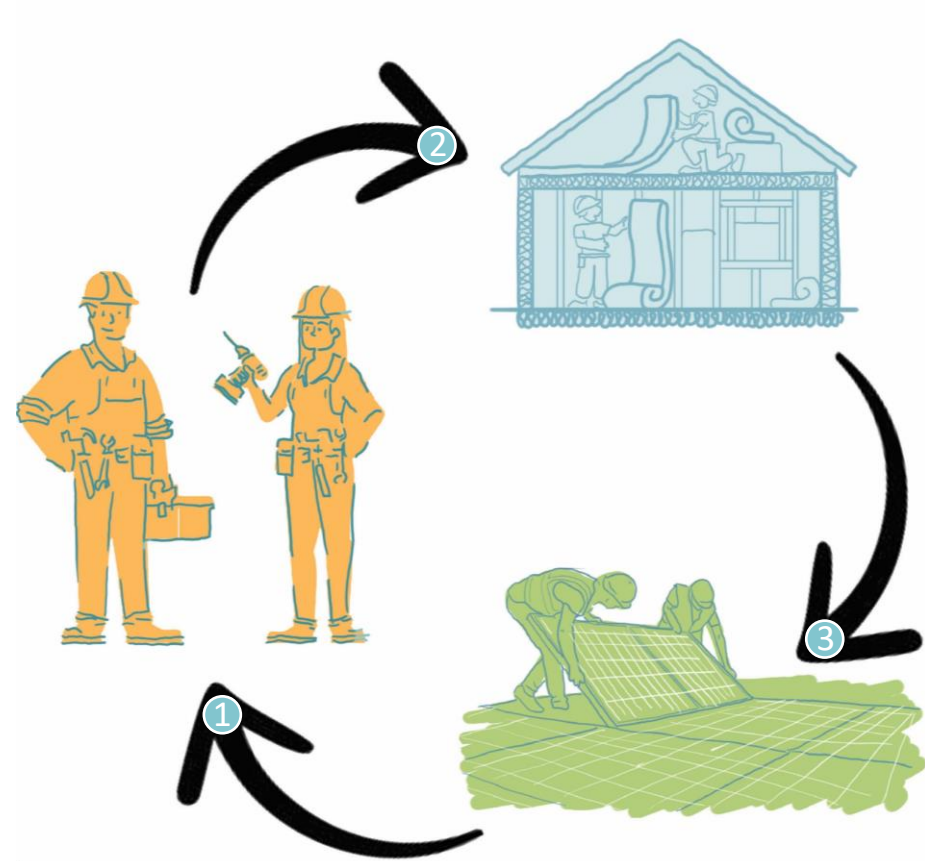
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from The Centre of Alternative Technology)*



Agenda

- The Principles
- 1 Small Interventions
- 2 Fabric First Approach
- 3 Technologies
- Case Study

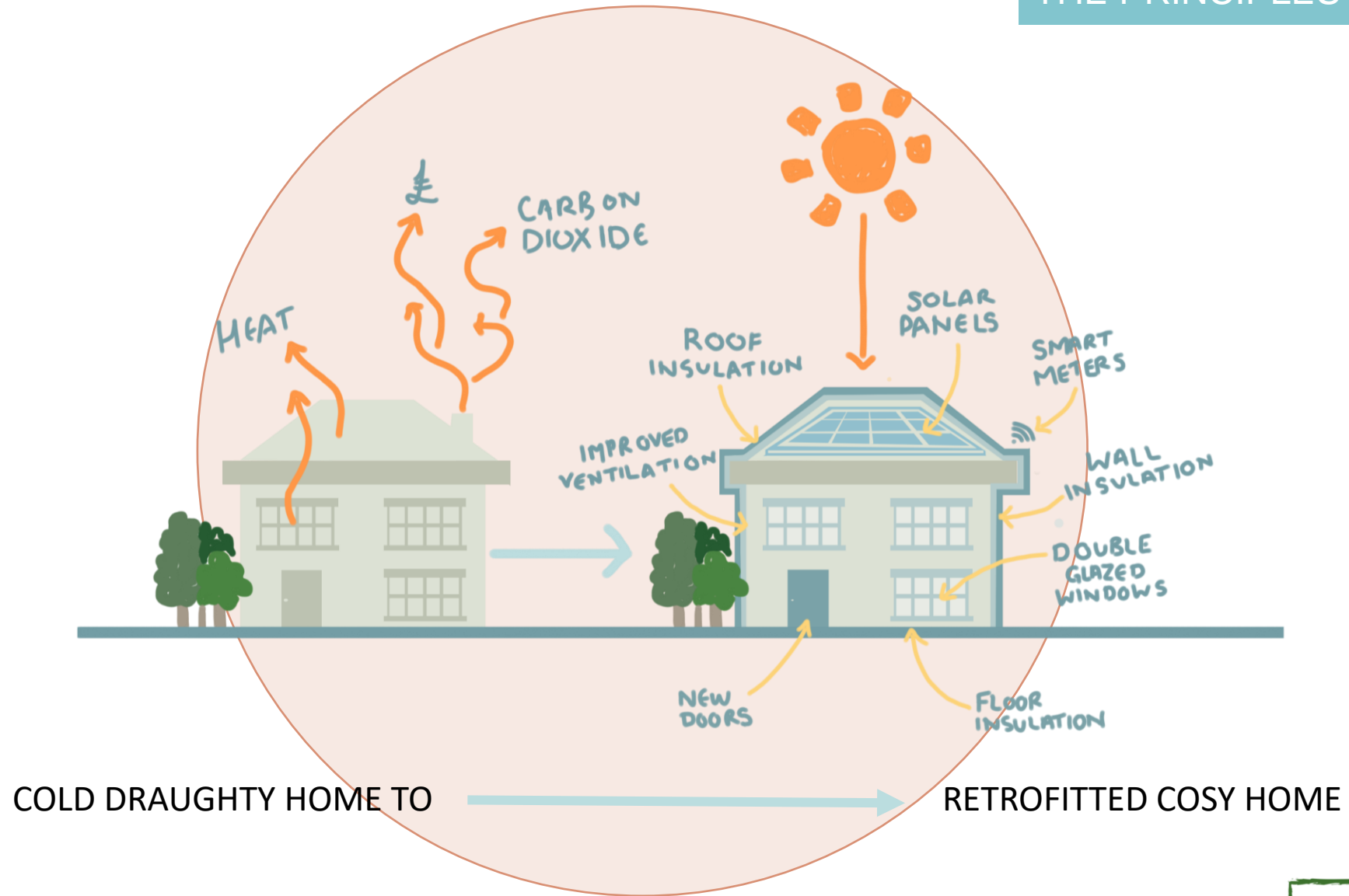


So... what is Retrofit?

“the act of fitting new systems designed for high energy efficiency and low energy consumption to buildings previously built without them”

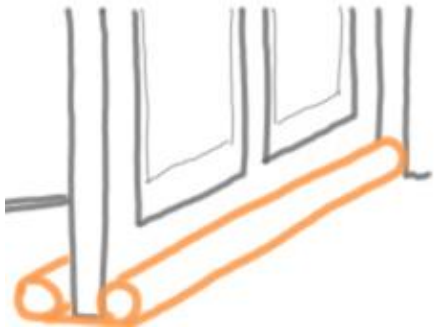
ELMHURST ENERGY

THE PRINCIPLES





Draught-proofing your home:



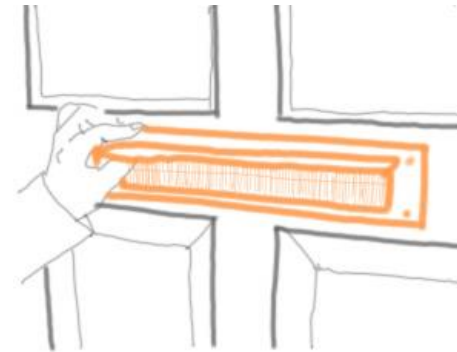
Install draught excluders on the doors of rooms.



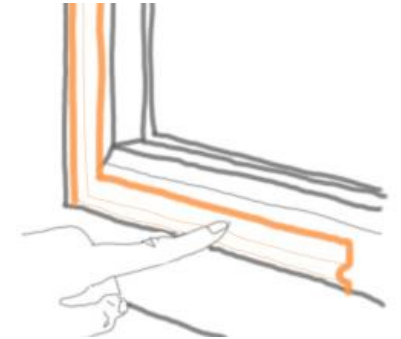
Prevent any openings between your door and its frame by using stick on rubber seal.



Utilize a cover to prevent cold air from entering through your keyhole.



Install a draught excluder inside the letter box.



Weather strips to give your windows additional insulation.



Draught-proofing your home:



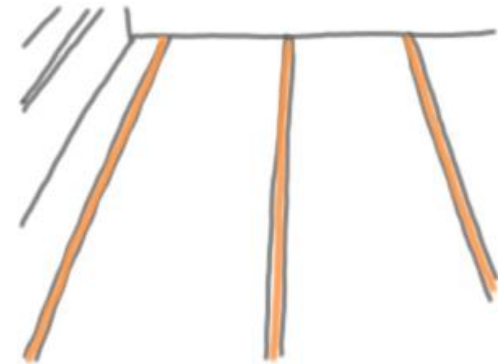
Reflective foil should be placed behind your radiators to reduce heat loss through the walls.



Floor length thermal curtains



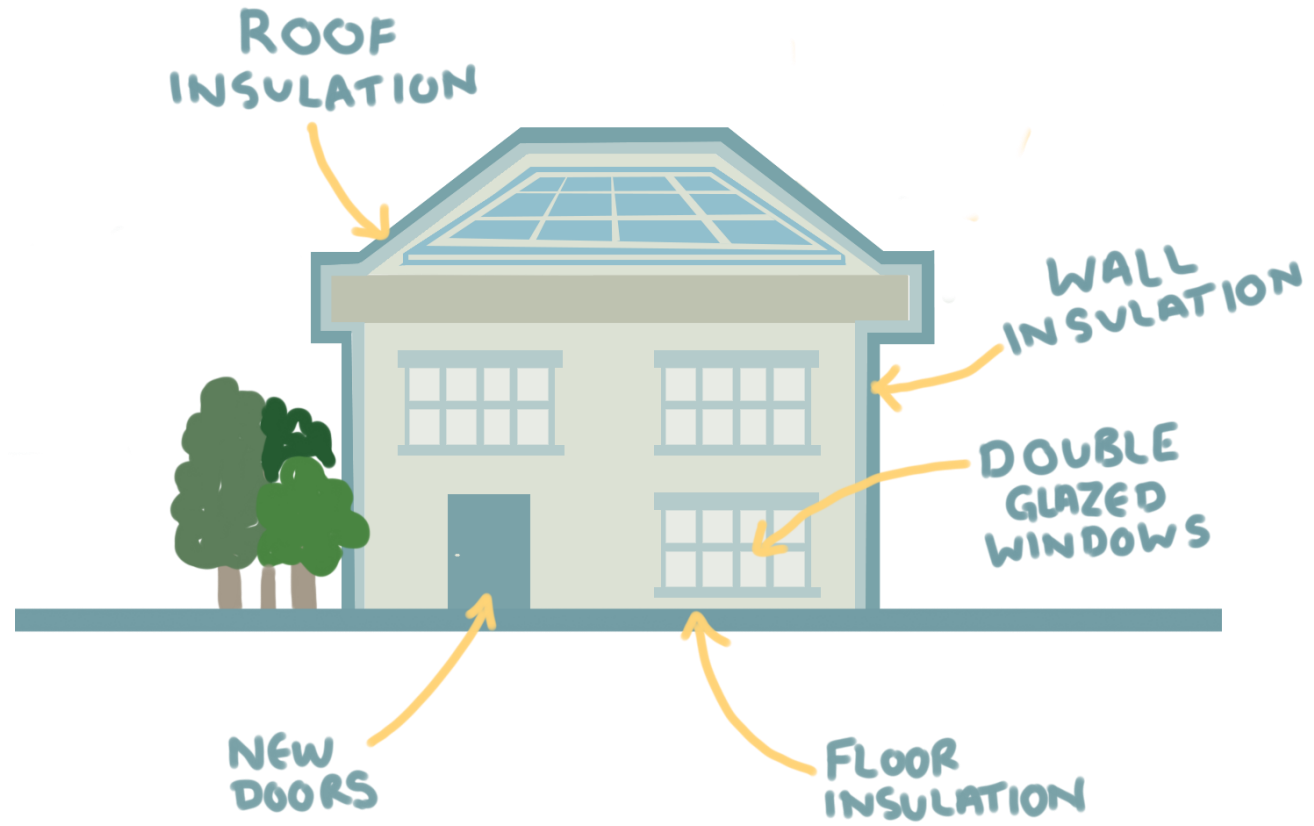
In order to help further direct heat back into the space, install a radiator shelf.



Fill in the gaps in your wooden floorboards with wood filler.



Application of Materials:





Application of Materials:



External Wall
Insulation



Internal Wall
Insulation



Roof
Insulation



Application of Materials:



Floor
Insulation



Double or Tripple
Glazed Windows

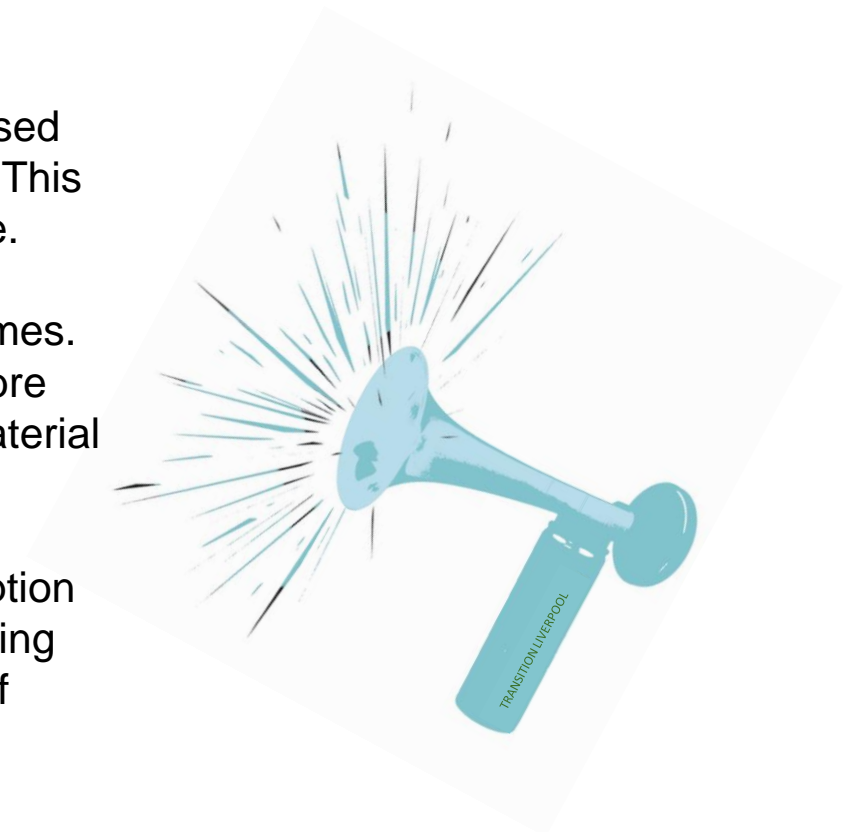


Higher Performing
External Doors



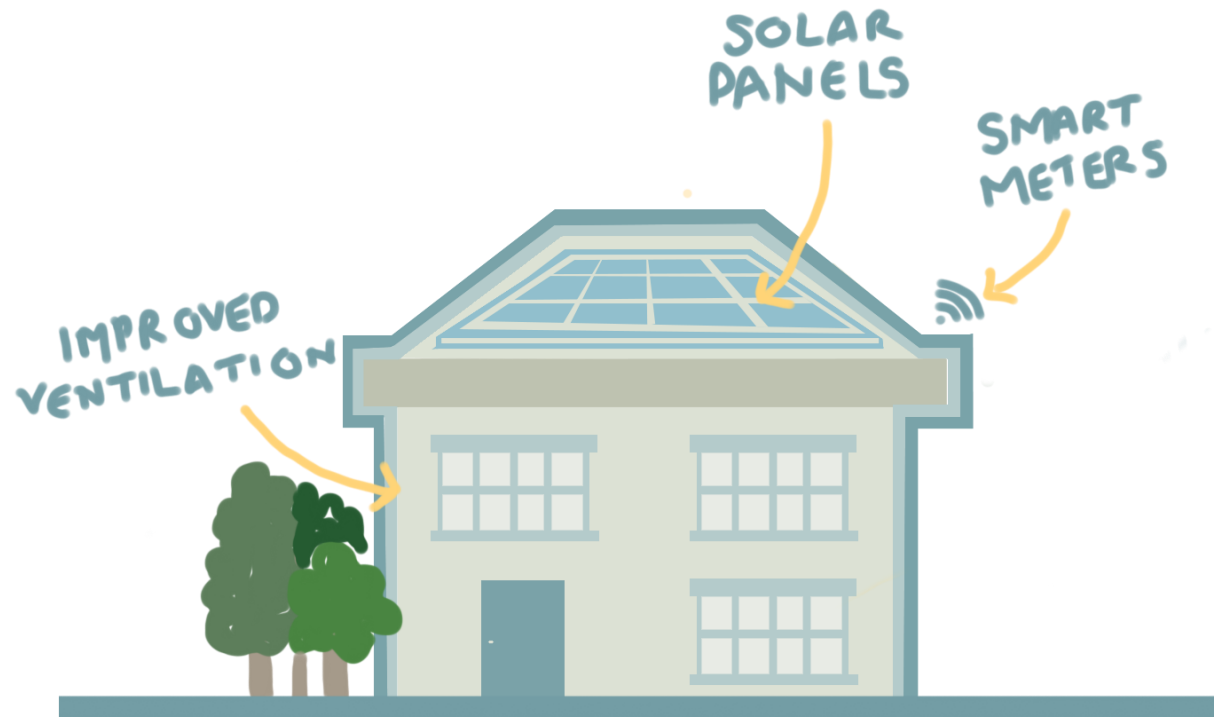
Key things to remember:

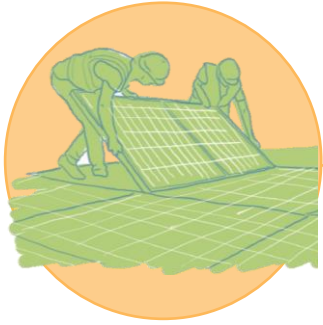
- Always get a specialist in to run tests on the proposed insulation applications for interstitial condensation. This will help to eliminate the risk of mould in your home.
- As well as a warm home, we also want healthy homes. Consider using natural insulations such as Woodfibre board and sheep wool and opt for non/low toxic material choices.
- If you have timber window frames, you have the option to replace the glazing only and house it in the existing frames. This could potentially make you a saving of approx. 80% in material costs.





Application of Technologies:





Application of Technologies:



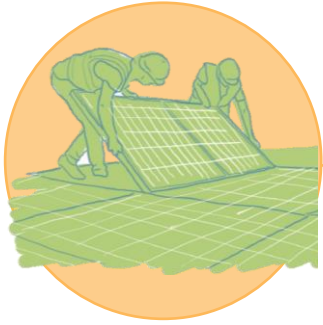
Air Source Heat
Pumps



Solar Panels



Mechanical
Ventilation Heat
Recovery (MVHR)



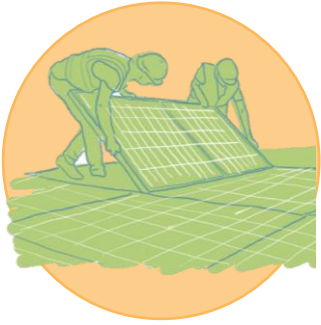
Application of Materials:



Heating Controls /
Monitors

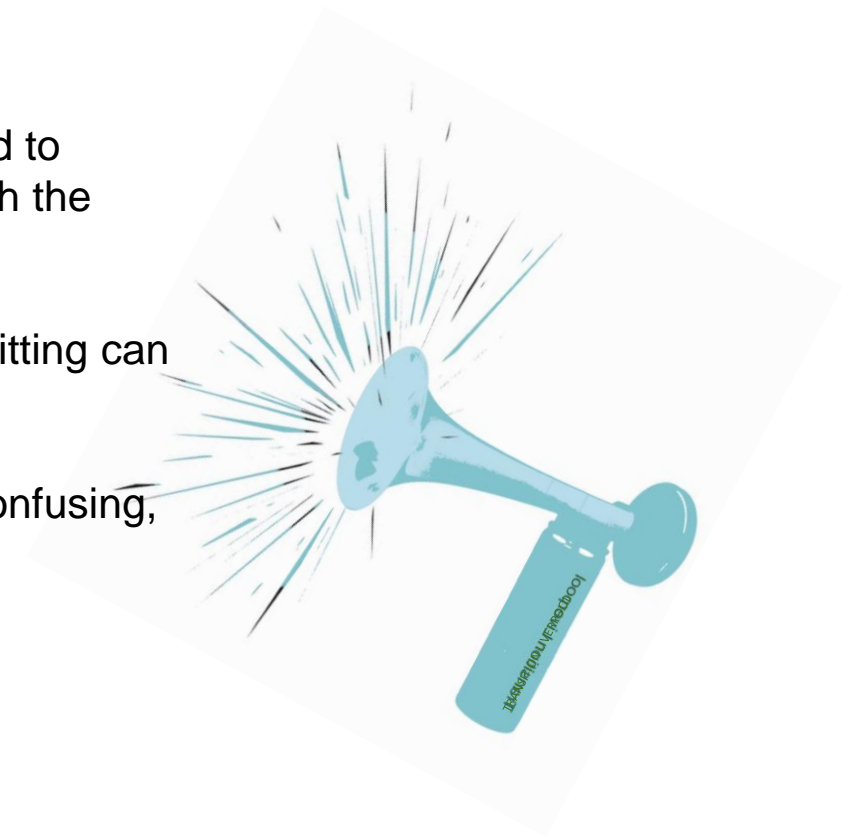


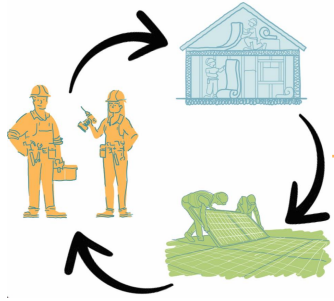
Smart Meters for
Energy Usage



Key things to remember:

- As you increase your energy use you may need to upgrade your electric meter system to deal with the extra load.
- Living through the installation process of retrofitting can turn your house upside down.
- Getting to grips with new technology can be confusing, get an expert involved.



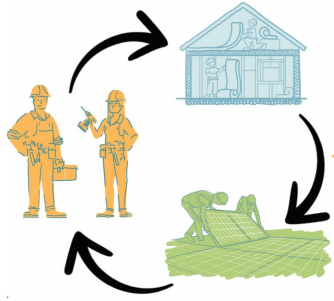


Retrofit of a Typical Liverpool Terraced House



Goals for the project:

- To achieve Enerphit certification for a single terraced house in Liverpool.
- To retain the character of the home and in turn the character of the street.
- Reduce energy bills not only with the use of insulation but with the addition of multiple technologies.



Retrofit of a Typical Liverpool Terraced House



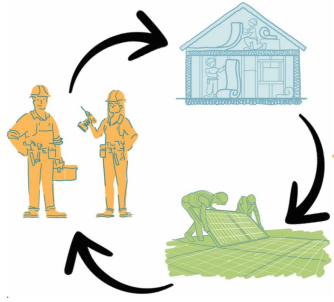
External Letter Box



Glapor to Internal Stud Wall. (To reduce thermal bridging)

Fabric:

- Roof removed and roof insulation applied before reapplying the roof finish.
- Internal wall insulation (IWI) to the front of the house and external wall insulation (EWI) to the rear.
- Existing internal suspended timber ground floor insulated by cutting a few holes and using a Q-bot.
- Secondary window glazing.



Retrofit of a Typical Liverpool Terraced House



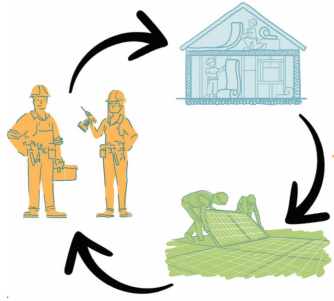
External Wall
Insulation



Vaillant Air Source
Heat Pumps

Technologies:

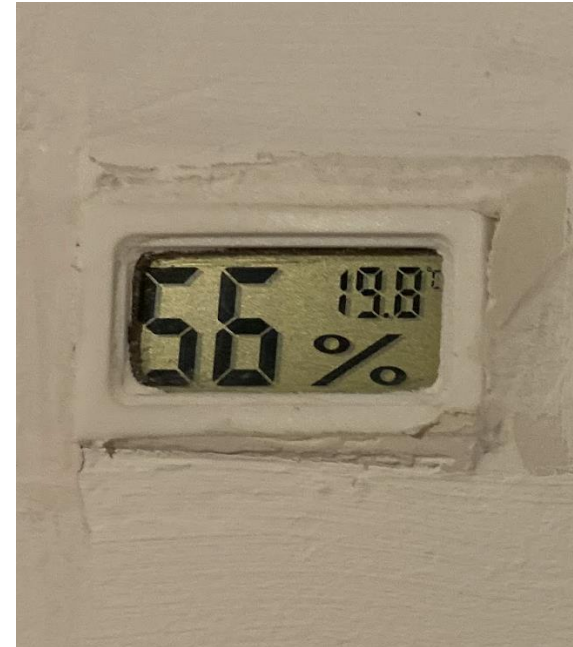
- Air Source Heat Pump.
- Solar Panels.
- Moisture monitoring system.
- Thermal water heating panels and additional water tank.



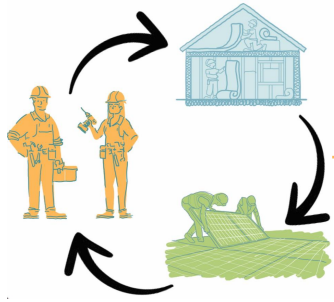
Retrofit of a Typical Liverpool Terraced House



Secondary Glazing



Moisture Monitoring
within Walls



Retrofit of a Typical Liverpool Terraced House: Systems Internally



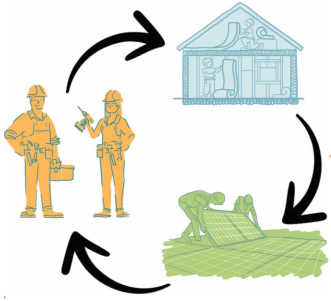
Solar Energy System



Water Tank System



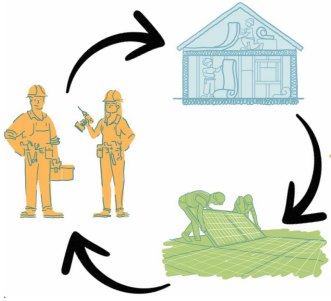
Air Source Heat
Pump System



Retrofit of a Typical Liverpool Terraced House

What was not successful:

- The Q-bot seemed like a good idea but in practice it didn't work as well in getting to all areas under the flooring to insulate it. Meaning some areas were left uninsulated leading to thermal bridges.
- Air tightness was not great for this project meaning Enerphit was not achieved. This is difficult to achieve when only retrofitting one house within a terrace.
- Instead of using a parge coat on the outside of the rear brick external was, it should have been applied to the inside to aid airtightness.



Retrofit of a Typical Liverpool Terraced House

What was successful:

- The use of wood fiber board for the IWI was nice as it's a natural material.
- The secondary glazing was successful and a good option instead of the removal of nearly new double glazed windows.
- The MVHR system is a good addition which also includes cooling features to avoid the home from overheating.



Thank you for joining
us today 😊

*From all the
Transition Liverpool Group.*

