A 1950’s semi-detached property

The Existing Property:
This is a 1950 brick built semi-detached property.

Structure:
Traditional brick-built structure with cavity walls, with three bedrooms and multiple reception rooms. Common clay roof tiles.

Windows & Doors:
Windows and doors double glazed uPVC without trickle venting. Windows are recent and in very good order. The doors are uPVC and same age as the rest of the windows.

Insulation:
Properties of this era rarely had cavity wall insulation built into the structure. There are no tell-tale marks on the outer walls to suggest that cavity wall insulation has been added at a later stage. Loft insulation is not consistent with an approximate 200mm cover. There is a small sloping section of ceiling in the front and back upper rooms. The thermal camera picks up various issues with the bedroom ceilings.
The area around the back door is only single skin in parts, and without a door between that area and the kitchen the heat loss will be high.

Power:
The property has a single-phase 100amp power supply.

Heat calculation:
I calculate the property heat requirements to be approximately 25kW. This is currently more than a single-phase renewable air source heat pump can deliver (see renewable heating systems). With improvements in the house’s insulation, it may be possible to improve this figure but unless the insulation works are extensive it is unlikely that a single-phase powered unit will be sufficient. With a power supply upgrade, it may be feasible to use a renewable air source heat pump.

Our Suggestions:

Insulation:
The best way to improve this property is to improve its thermal efficiency and reduce its overall heat loss. This process can be distributive but in terms of capital investment will give you the best return. The best approach to reducing your environmental impact is to reduce the amount of energy you need to consume to heat your property. Some of the renewable heating options have a limited output (see renewables section) when you only have a standard domestic power supply.
The outer brick wall should be investigated for the presence of insulation by a qualified inspector/contractor. If no insulation is present and the cavity is of sufficient depth, then it may be possible to inject a suitable product. These include blown fiberglass, blown cellulose polystyrene beads, and expanding foam. The best product for this application will depend on what is found during the investigation process. Be guided by a practiced contractor in the field.
The amount of loft insulation should be increased to a minimum of 300mm, although 400mm would be better. The process is a simple one if the loft is not full. If there is an existing floor in the loft the new insulation can be rolled over the top. If storage is required there are products readily available such as loft legs that will hold the new floor above the insulation layer, crushed insulation is not effective.
The loft insulation needs addressing, a minimum 300mm of fibre roll insulation is recommended, I would suggest that two 200mm layers (laid at 90 degrees) be installed. Special care should be paid to the sloping area along the roof lines.

Windows and Doors:
The windows and doors are in good order and performing well and need little attention.

PV
Your roof is not ideally orientated for PV panels so you would have to split the system over two sides of the roof, effectively reducing the output by half, doubling the payback time on the investment.

Summary:
This house is a solid property with no major issues. A check of the wall insulation is advised. The loft insulation is a simple activity that will yield a good return on the investment of both time and money.
The back door to kitchen transition should be addressed, either by improving the insulation of the outside walls or introducing a barrier between the areas. A door or at least a heavy thermal curtain should be considered, certainly until the ambient temperature improves.
Improving the heating control system will also improve the systems efficiency.
With the current power supply, the use of a renewable heat source is not really an option, but you may wish to consider a hybrid system. Your current boiler will serve as the fossil fuel back up.
Comments from the owner:
I think the report would be useful for other homeowners in Walton Place with similar build, state of energy efficiency improvements, who might not necessarily have researched how to improve the energy efficiency of their home.