Mildmay Community Centre -

Certified Passive House

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Specification Manager Renewable Energy Systems

Mildmay Centre

- **A history of generation:**
  665m² structure originally built in the early 1900's to house generators for the tram network.

  The building became derelict in the late 1960s.

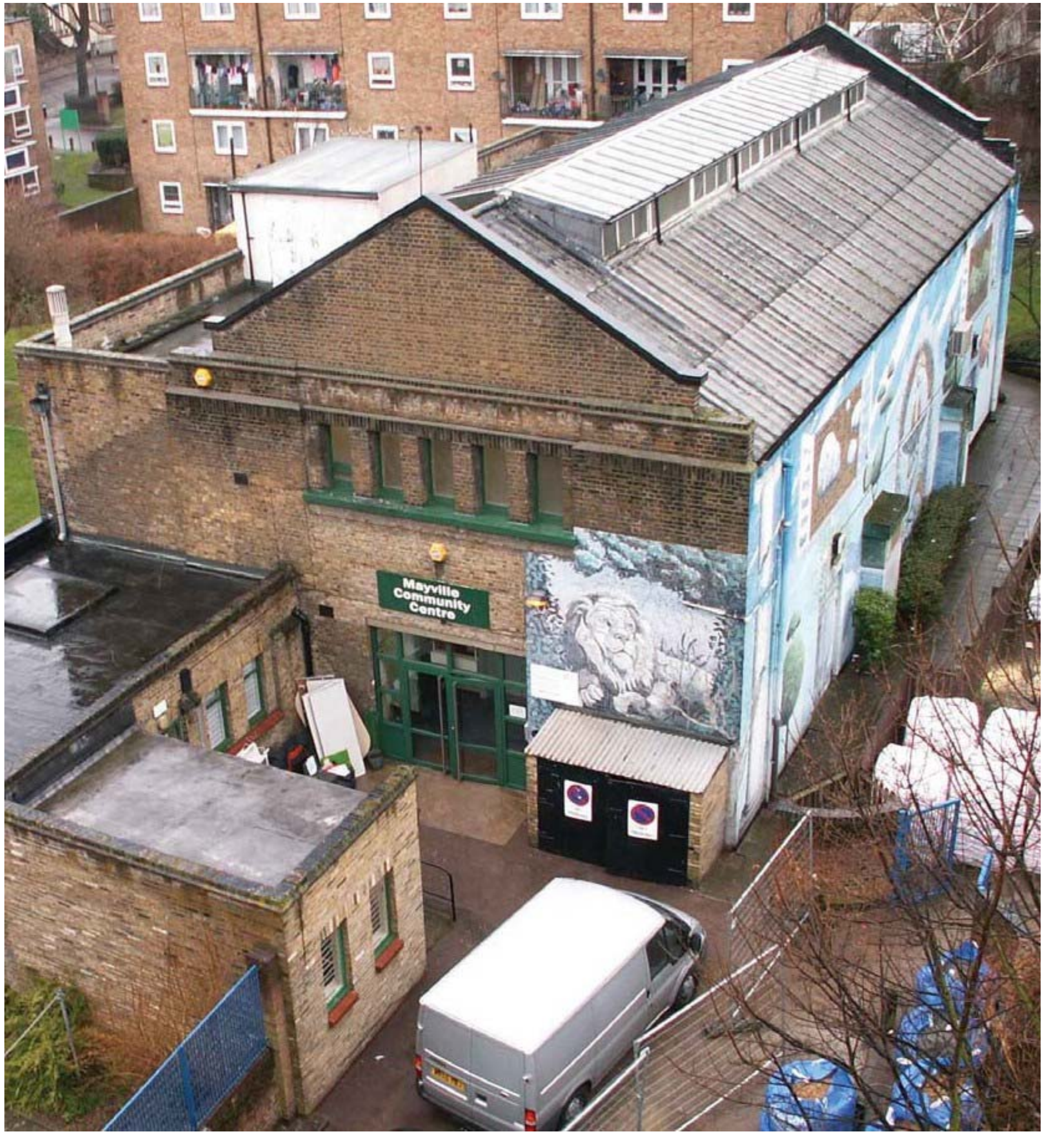
  It became a community centre after local residents lobbied Islington Council for possession of the building in the 1970s.

Historic photo before refurbishment

Mildmay Centre

Before refurbishment:

- Un-insulated asbestos roof
- Depressing appearance
- Confusing entrances
- No doors to garden



South elevation before refurbishment

Mildmay Centre

Before refurbishment:

- Metal framed, single glazed, draughty windows
- No windows to basement
- Freezing draughts swept across basement from ventilation grilles

South elevation before refurbishment

Mildmay Centre

Before refurbishment:

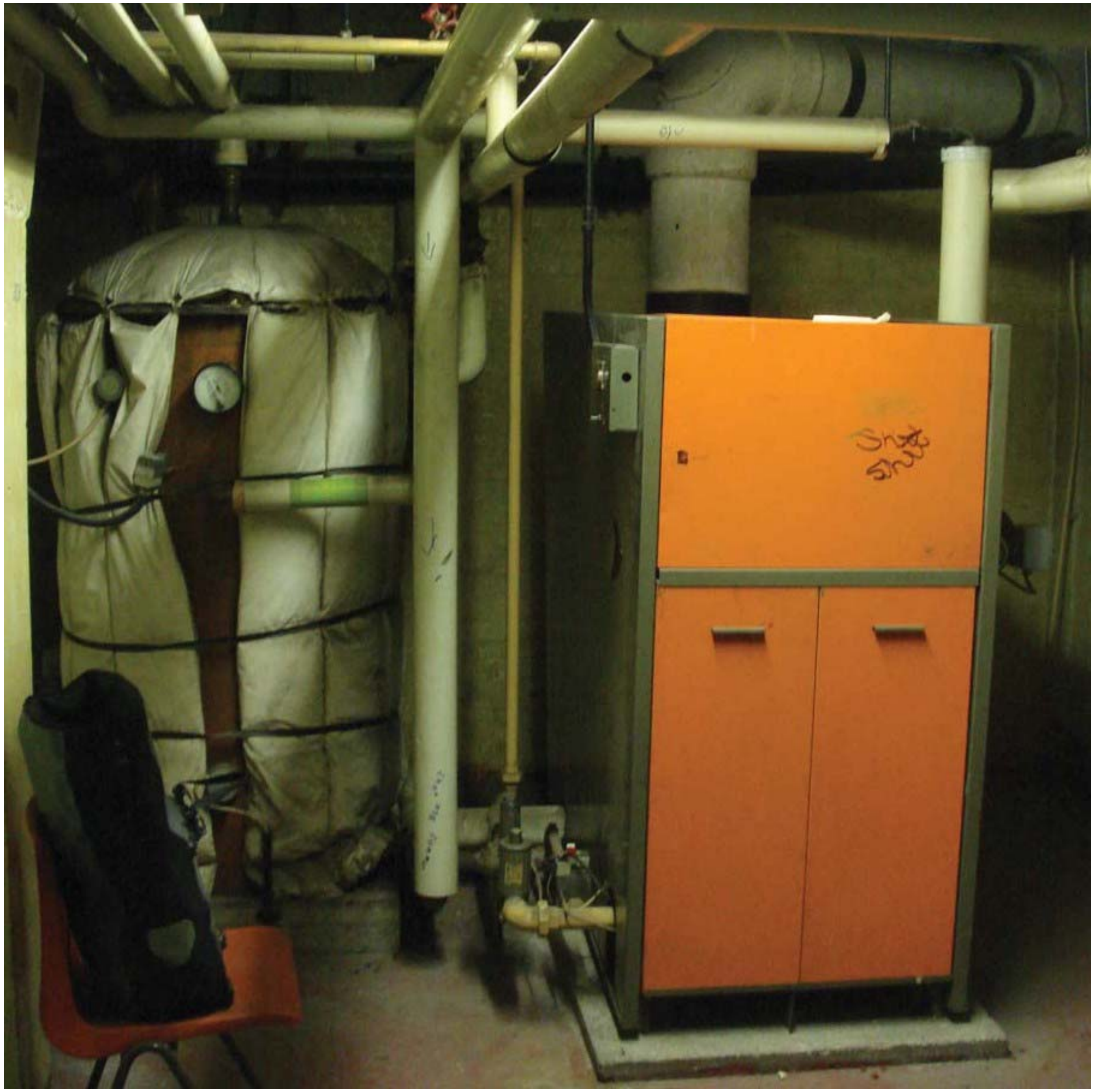
- Gloomy, depressing spaces
- Echo made hearing or engaging in conversation difficult - particularly for the elderly
- Bad layout and shortage of space
- Freezing cold in Winter!

The main hall before refurbishment

Mildmay Centre

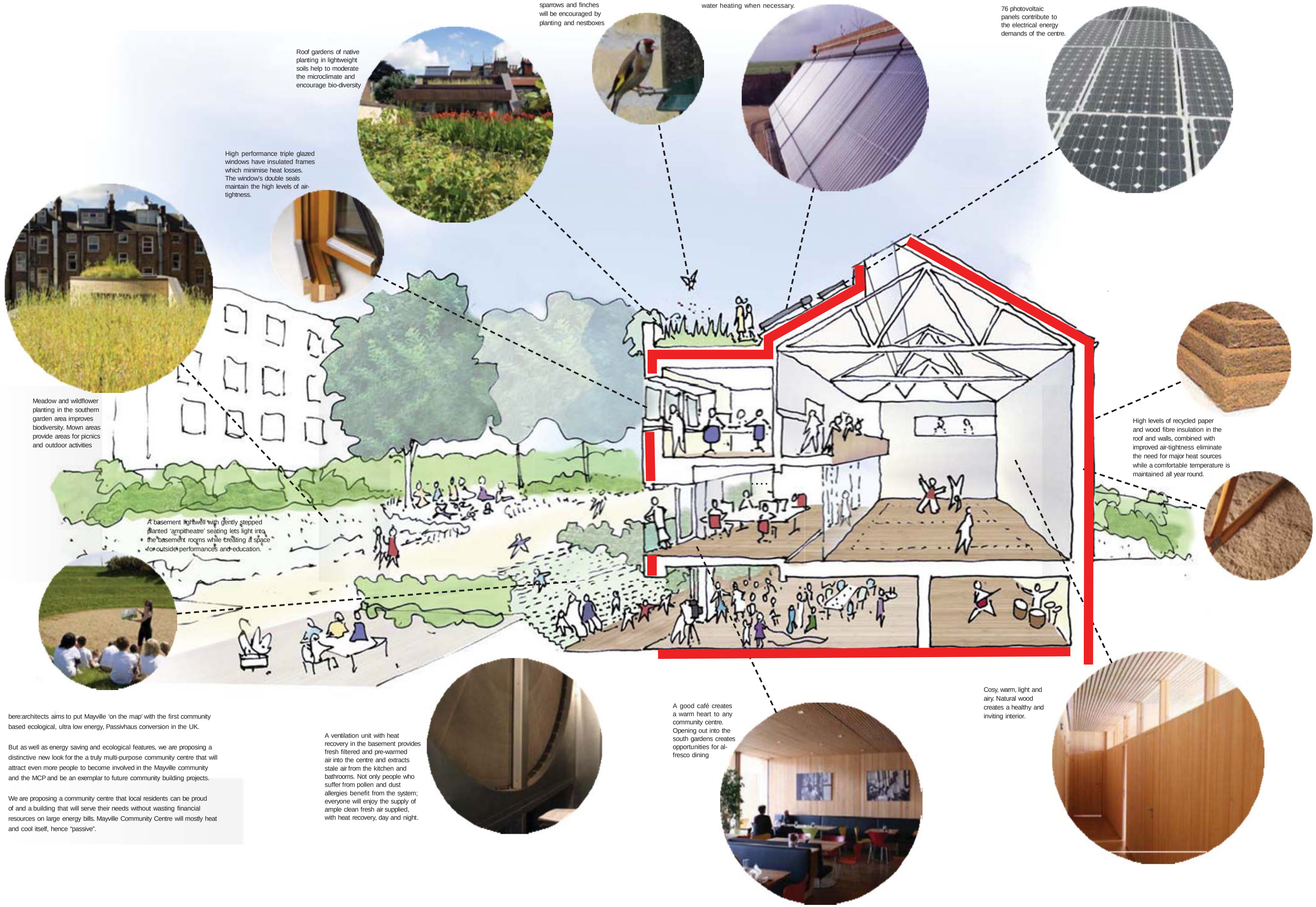
Before refurbishment:

- Difficult to achieve comfortable conditions in winter. Office extension was hot in winter, while main hall was often too cold for sedentary activities, particularly for the elderly
- Total energy demand 581kWh/m²/yr if 21°C winter temps maintained (but 272 kWh/m²/yr in reality due to high energy cost)
- Energy bills over £ 10,000 a year for an organisation with turnover of £60,000 a year



Gigantic gas boiler and virtually un-insulated tank

Mildmay Centre - holistic approach



bere:architects aims to put Mayville 'on the map' with the first community based ecological, ultra low energy, Passivhaus conversion in the UK.

But as well as energy saving and ecological features, we are proposing a distinctive new look for the truly multi-purpose community centre that will attract even more people to become involved in the Mayville community and the MCP and be an exemplar to future community building projects.

We are proposing a community centre that local residents can be proud of and a building that will serve their needs without wasting financial resources on large energy bills. Mayville Community Centre will mostly heat and cool itself, hence "passive".

Mildmay Centre - after refurbishment

The UK's first fully certified non-domestic passivhaus refurbishment

The refurbished Mayville Community Centre South Facade

Mildmay Centre

The main hall after refurbishment

Mildmay Centre

"Comfort has exceeded expectations" "Better than home"
"Never too cold and never too warm" "Affordable comfort"

Community building in the main hall

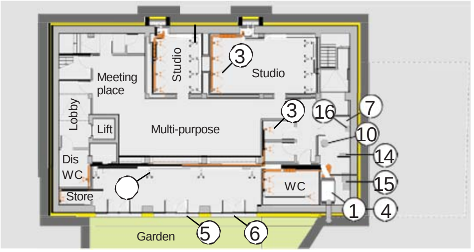
User Guide

Mayville Community Centre

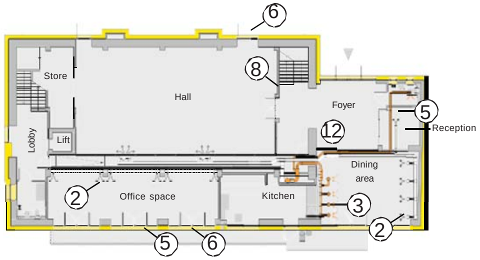
This building is a Retro-fit Passivhaus.

The term passivhaus refers to an advanced low energy construction standard for buildings, which have excellent comfort conditions in both winter and summer. They typically achieve a heating saving of 90% compared to existing housing. Passivhaus buildings are easy to live in and require little maintenance, but they do have some important features, which are explained in this guide. The features are simple to operate, but a full understanding will help you get the lowest energy consumption and best comfort. This guide has been design by Alan Clarke and bere:architects for you (the user) to understand how a passivhaus works and how to operate the controls in this house.

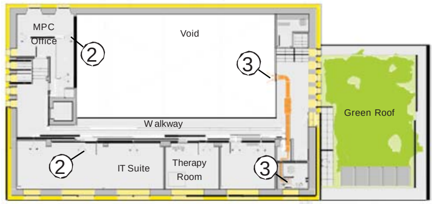
Each feature is labelled on the drawings below, highlighting their locations and briefly explaining how to operate them in the corresponding text. Please take the time to read this guide and familiarise yourself with the controls.



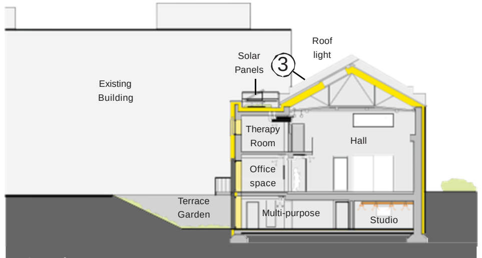
Lower Ground floor plan



Ground floor plan



First floor plan



Section B-B

1 Heat recovery ventilation unit

Provides continuous fresh air to the community centre, and saves heat from WCs and kitchens to warm fresh air for the office, main hall, dining room IT suite etc. The system saves about 10 times more energy than it uses! It is located in the plant room. The filter needs changing every 3 months in London air.

2 Fresh air vents

The heat recovery ventilation unit keeps the air fresh and pre-warmed in winter, using these fresh air vents.

3 Extract air vents

These vents remove possible stale and damp air from the kitchen, main hall and WC's. The ventilation runs 7am - 7pm. The extract air vent filter in the kitchen needs to be vacuumed about every 3 months depending on how much cooking is done.

4 Heat recovery ventilation control panel

To control air flow. this should not be altered under any circumstance

5 External blinds control (for summer cooling)

In summer the outside blinds minimise solar gains from the sun. These are manually controlled by the centre manager from reception.

6 Night cooling

To keep cool in the summer take advantage of colder night time temperatures outside by leaving the windows open in the "tilt" position overnight (subject to site security). If it's hotter outside in the day you can shut the windows and external blinds.

7 Timer for ventilation

Currently set to run ventilation from 7am - 7pm, 7 days a week

8 CO2 Sensor for main hall ventilation

Due to the large air volume in the main hall, it is only necessary to add fresh air when larger groups of people raise the CO_2 level to around 1000ppm

9 Radiators and thermostatic valves

Simple, easily understood thermostatic radiator valves give individuals control of their space temperatures

10 Hot water storage

Hot water is always ready in the tank this is due to the tank being very well insulated so that the water will not cool down overnight.

For bathroom + kitchen use

A smaller Tank for radiator use

11 Hot water from the sun

A solar themal vacuum tube panel supplies 60-80% of the annual hot water usage. In winter the panel can heat the bottom half of the tank and the boiler is used to top up the temperature. This means there is always hot water available in the tank even on a cloudy day.

12 Fire alarm control

This is the central fire alarm control, located in the entrance hall.

13 Lighting control

These dimmer switches provide a choice of light levels in some rooms. However dimmable lighting was removed from some spaces to save capital costs.

14 Heat pump

To provide heat for domestic hot water tank and heating tank.

15 Rain water (grey water)

Pump to recycle rainwater for WCs. 6500 litres of water is saved under the south garden for WCs. An additional 5000 litres of water is saved for the garden.

16 Electrical sub metering

These submeters can be illuminated by pressing a button on the face. We are measuring data every monday for research purposes.

VIESSMANN

Mildmay Centre

Heating via a Vitocal 300G 7.8kw ground-source heat pump

Restricted available land meant the ground loops had to be decked

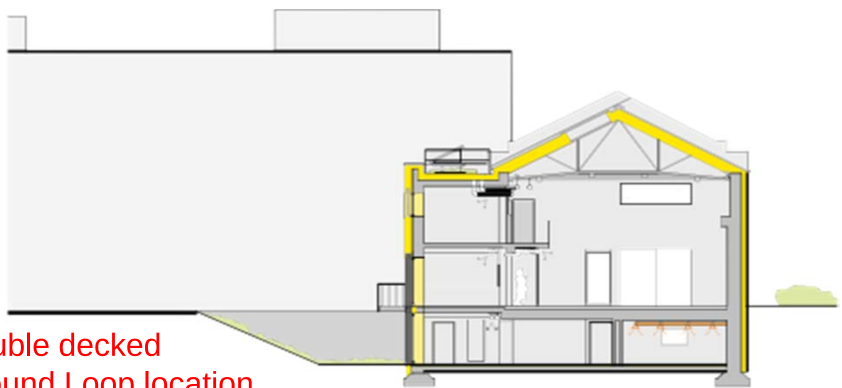
Radiator circuit designed with a flow temperature up to 45°C

DHW supported by 3m² Vitosol 300-T Solar Thermal Tubes

Thermostat & controls in the main hall

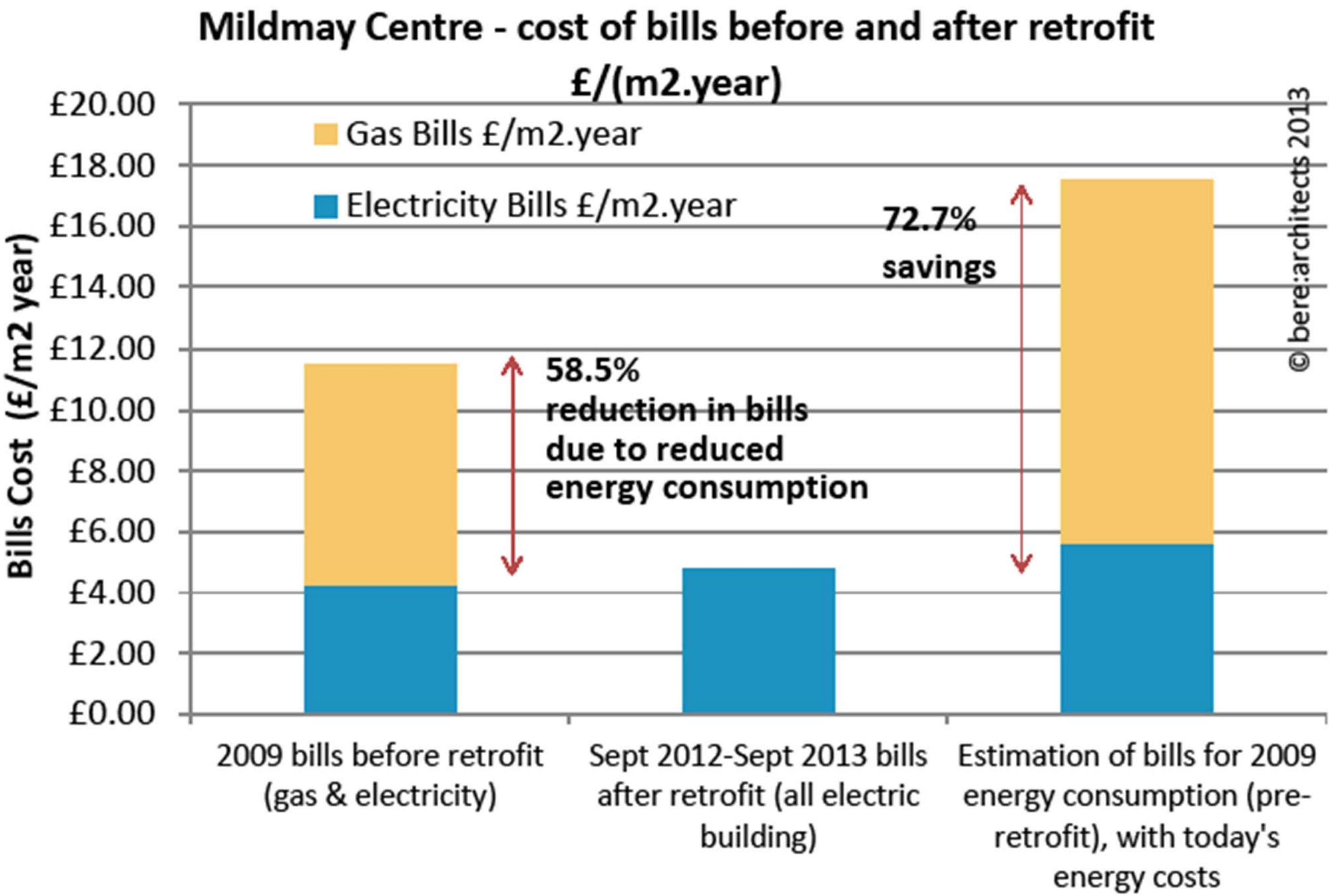
Building now heated totally by electric

127m² photovoltaic panels on 2 roofs offset electric consumption



Double decked
Ground Loop location

Mildmay Centre



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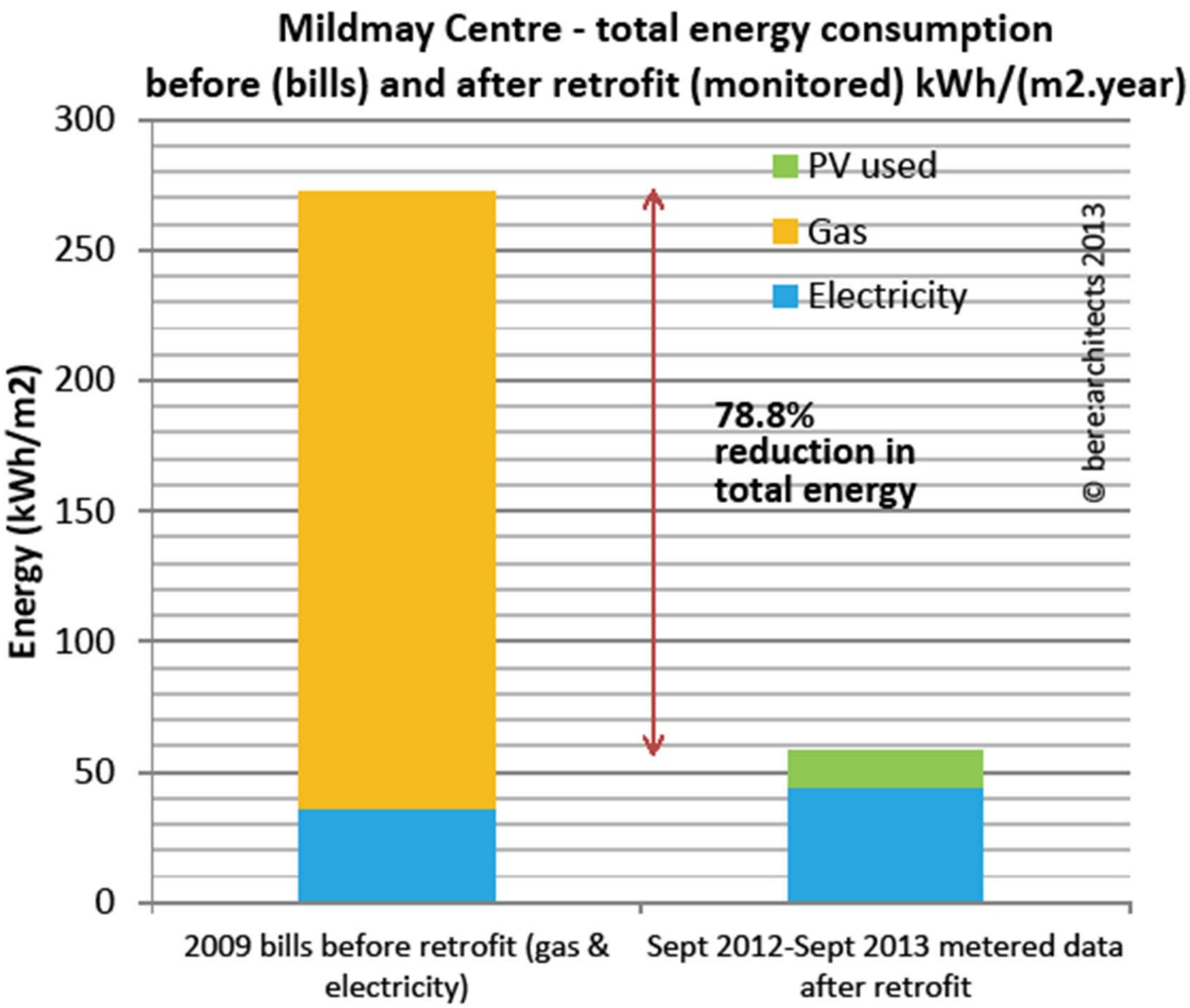
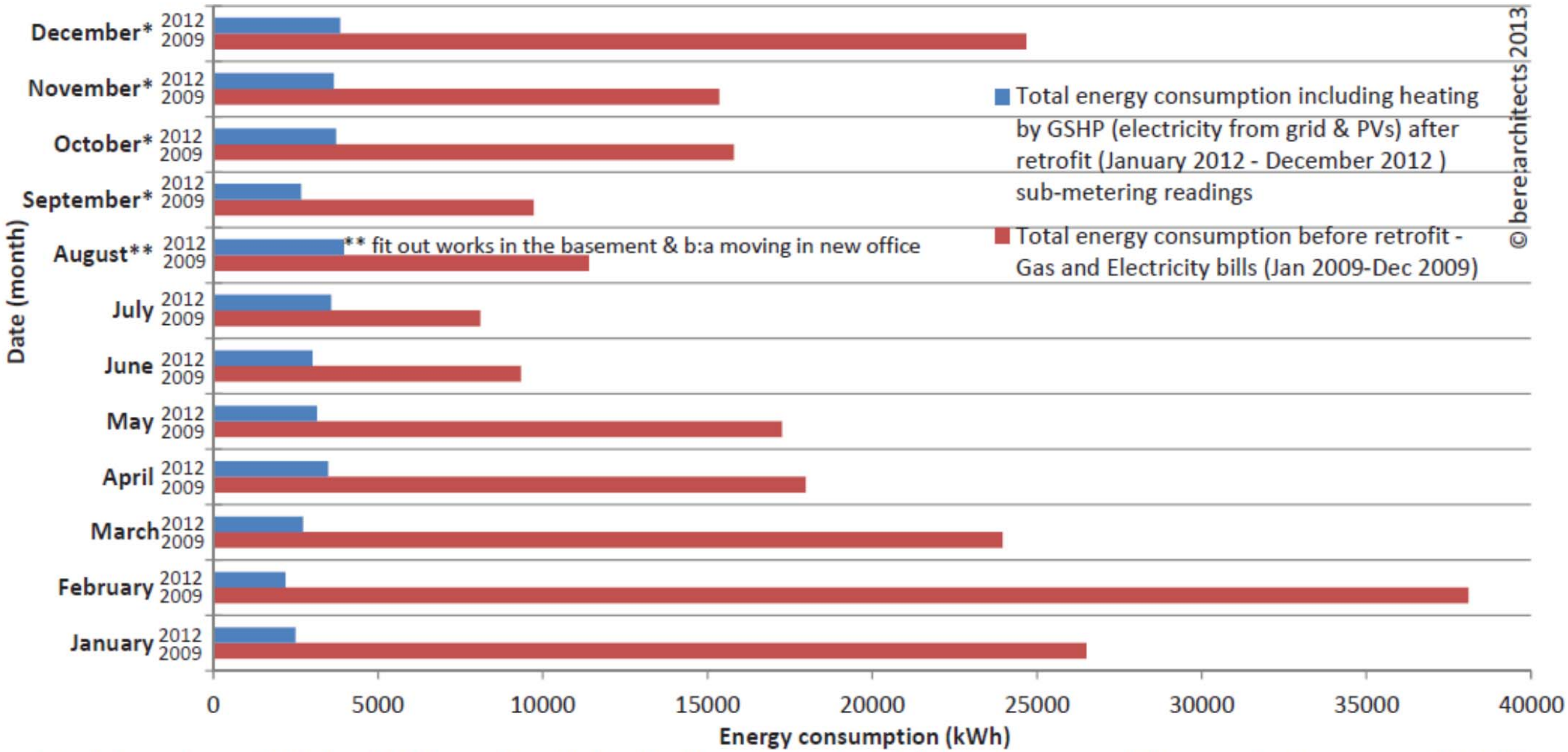


Mildmay Centre

Energy performance comparison before and after retrofit, first year of monitoring, 2012

80% reduction in energy consumption

Mayville Passivhaus Community Centre Yearly energy consumption comparison
Before retrofit (gas + electricity bills Jan 2009 Dec 2009)
And after refurbishment all electric building
(sub metering data: EDF grid import + PVs* Jan 2012 Dec 2012)



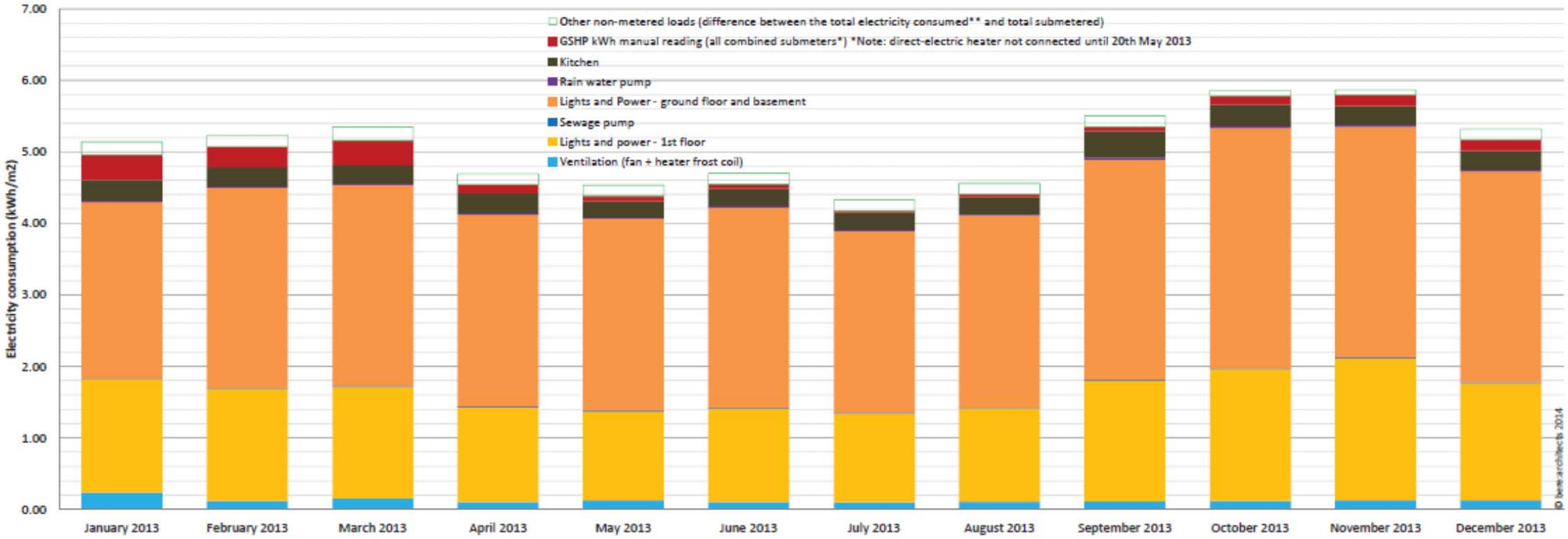
* data between January 2012 - August 2012 was collected before the PV export sub-meter installed; for the purposes of this comparison it was assumed that all the electricity generated by the PV arrays was used entirely in the building, nothing exported back to the grid. From September 2012 the figures reflect the amount of electricity produced by the PVs and actually used by the building

Mildmay Centre

Monitoring data: energy consumption by end-use

Between January 2013 - December 2013, the ground source heat pump used approx. 3% of the total energy used in the building (solid red colour in the chart below)

Mayville Centre - electricity consumption by end- use - kWh/m2/month - January 2013-December 2013



Note: PV export meter not working after April 2013. PV export to the grid assumptions made based on metered data for PV generation and total loads (submeters)

Thank You