

# Banwell Youth and Community Centre

## Building and construction

Banwell Youth and Community Centre is a mixed-use community asset based in the parish of Banwell, North Somerset. The original age of the building is unknown, but it has had a complete refit in 2008 (costing circa £250k) and was taken over from North Somerset Council by Banwell parish Council in 2019. Further remedial works were undertaken during the COVID pandemic in 2020.

The building is single-storey, but the level of the ground changes as you move through the building, so the rear of the building offers a large double-height space which also houses the Council office. The building has a total internal space of 244m<sup>2</sup> and a carbon intensity of 11.48kg CO<sub>2</sub>e/m<sup>2</sup> (scope 1 and 2).

The building is constructed from a double-thickness breezeblock skin separated by a damp-proof membrane, with no cavity. The outside of the building is rendered. The roof is pitched, and covered with metal that is textured and coloured to look like traditional roof tiles. All the windows are double-glazed, and there is a glass conservatory entrance at the front of the building.

The general state of the building is very good, with only one superficial crack.

## Building use

Banwell Youth and Community centre is a mixed-use building, and usage has dropped considerably post-COVID.

The Parish Council uses the office for two mornings per week, and other community groups (including Forest school and Citizen's advice) utilise it periodically throughout the week. In total it is used for around 3 days per week, with sporadic or zero use on Friday, Saturday and Sunday.

Whilst the hall is available for public rental, Banwell has other comparable community assets that are run as charities. Banwell parish council chooses not to compete on price so as not to reduce charitable income. The plot is owned by Wessex Water and there is a clause on the lease that prevents profit from being made on the land or the buildings or land being disturbed. This prevents installation of a ground-source heat pump, and the planting of productive trees.

## Constraints

In addition to the lease constraints detailed previously, and considerations around cost, the only constraint is that the building is situated in a conservation area.

## Decarbonisation: Current situation and suggestions.

**Windows and apertures:** Windows are double-glazed throughout (Image 1). The front of the building has a glass conservatory entrance that is susceptible to solar gain in summer and heat loss in winter impacting the comfort levels in the building.

**Mitigation:** All the windows are double glazed and in good condition. Often, curtains and blinds can be used to provide additional insulation in winter and can reduce solar heating in summer. However, in the case of Banwell, many of the windows are of a shape, design and position that would make this untenable, and would be likely to result in reduced natural light and the unwelcome trade-off of increased energy use for lighting.

In the case of the conservatory, reflective solar blinds could be an effective and relatively low-cost solution to reduce heating in summer. In the winter these would not hugely impact heat loss and upgrades to the thermal efficiency of the glass would likely be prohibitively expensive. Porches in general can be very effective thermal seals and improve energy efficiency so a rebuild using more thermally efficient materials is an option albeit likely an expensive one. In the first instance ensuring that all doors and windows are draught proof is recommended. Approaching the problem more holistically, it may be beneficial to fill the window space with as many plants as practically possible which would improve air quality and is proven to have a positive impact on wellbeing. Whilst they may provide shade in summer and could disrupt convection currents that lead to heat loss, this impact is likely to be minimal when compared to changes to the fabric of the conservatory itself.



*Image 1: Window at Banwell*

**Insulation:** The building is insulated to the minimum requirement for 2008 building regs. From inspection it appears there are a couple of inches of insulation on roof lining boards (Images 2 and 3), however there are gaps between these boards which will massively reduce their effectiveness, potentially by a factor of between 30% and 50%. The visit took place on a cool day and the temperature inside was pleasant. The Clerk reports that the building is lovely and cool in the summer, even in the excessive heatwave.



Image 2: insulation thickness



Image 3: Insulation panels

**Mitigation:** The case for additional insulation is mixed. Considering the sporadic use of the building and the weak business case for installation of low-carbon heating systems, internal or external wall insulation is not recommended due to cost. Improvements to the roof insulation would be a relatively low-cost way of increasing energy efficiency. This could be approached by increasing airtightness on the existing boards, or installing a different and more leak-proof solution such as cellulose fibre.

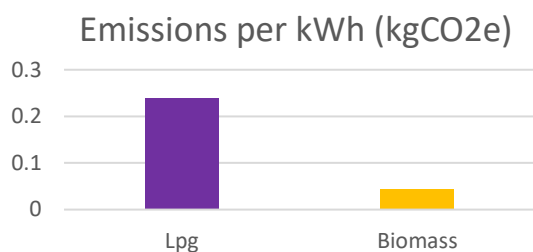
**Space heating and hot water:** LPG emissions 2021 totalled 1.6 tonnes of CO<sub>2</sub>e. The building is not on mains gas and is currently serviced by an LPG fuelled combi-boiler (Image 4), installed circa 2008. It was last checked in 2022 and is currently working well. The LPG gas tank is situated in the building carpark and is filled every 2 months by Avantia. The building utilises standard radiators with large metal covers, and there is an oil radiator in the Council office. The top of the building is controlled by a 'Nest' smart thermostat, however apparently the system does not support additional heating controls.



Image 4

**Mitigation:** The Council explored the possibility of installing a heat pump in 2021, however at £40k the associated cost was deemed prohibitive given the low usage of the building and high payback period. The sporadic nature of the building's use necessitates the need for high-grade heat on demand, rather than the low-grade constant heat that is a feature of heat pumps. Another potential solution to reduce carbon emissions would be through the

installation of a biomass boiler. However, this would again be a high-cost option, and the wider sustainability impact of wood pellets would need to be taken into account. In the current situation, it is recommended that decarbonisation interventions focus on energy efficiency rather than system upgrade. Where possible, pipes should be lagged and zonal heating controls used to their full potential. The condition of the boiler should be continuously assessed, as *when the time is right for its replacement*, the upgrade cost should be leveraged against the cost of an alternative system such as an air-source heat pump. The affordability and efficiency of heat pump technology is likely to improve along with the availability of financial support as fossil-fuelled heating solutions are increasingly phased out over the next decade.



**Lighting:** LED lighting is used inside and outside, with light and motion sensors used for external lights. The only sensor used inside the building is in the cleaning cupboard.

**Mitigation:** Install further light sensors throughout the building, especially in areas such as the bathrooms. It is likely that the overall impact of these will be low, considering the size of the building, however they are a relatively low-cost intervention.

**Other considerations:** There is no aircon in the Parish Hall, and the only refrigeration is a domestic fridge-freezer in the kitchen. Any cooking does take place on a relatively old electric hob which is likely to be highly inefficient (Image 5).



Image 5

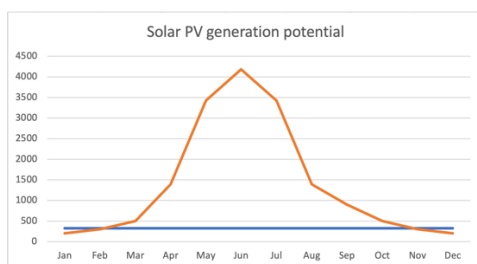
**Mitigation:** As with all electrical equipment, the most energy-efficient example should be chosen when items are being replaced. Switching to induction hobs over gas or electric can result in an efficiency saving of up to 80%.

**Solar at Banwell:** Banwell council's buildings are situated in a low-density area with no buildings or trees to shade a rooftop solar array. The building's pitched roof is orientated East to West.

Due to relatively low overall electricity use, it is highly possible that a solar array would cover all electricity demand on most days. Given the available roof space, it is possible that at certain times of year an array could produce more than the building would require. In this instance excess energy could be exported to the grid, or battery storage systems could be used to save the surplus for times of excessive demand, or reduced solar irradiance.

Banwell would have options with regards installing Solar PV. An array could be split between the East and West face, or a larger array on one face. Splitting the array between faces would maximise energy generation compared to an array installed exclusively on one side. However, putting the array on a single side would increase output at specific times (East facing = higher morning output, West facing = higher afternoon output). A technical survey of these options should be undertaken to fully elucidate opportunities, and a solution sought that best aligns energy production with the building demand.

Based on a top-level assessment of solar irradiation levels in the South West and the size of Banwell's roof (circa 275m<sup>2</sup> total), there is the potential for each face of the roof to produce 16,720 kWh annually, which is more than the buildings reported electricity use. However, this is based on yearly averages and the seasonal output can vary by a factor of up to eight.



**Travel:** Banwell Council undertake minimal travel as the need to attend physical training sessions and conferences has been largely replaced by online communication post-pandemic. The Council Clerk uses her own car to purchase supplies from the cash-and-carry, but otherwise there are no regular travel requirements.

The building has rings for bike storage, although there are no showers. Public transport links are good, and the launch of 'Westlink' allows for bookable transport throughout North Somerset from anywhere with a bus stop.

There are no EV chargers available currently, however North Somerset Council are installing charge points as part of the bypass project in 2025.

**Mitigation:** Given the general lack of transport being undertaken, and the installation of EV charge points being part of a wider pipeline of works, the biggest impact that the Council are likely to have is by providing details of low-carbon travel options to the people choosing to use the building.

**Waste:** All waste is segregated and collected by North Somerset Council. Terracycle have a collection point for the disposal of soft plastics.

**Mitigation:** Following the waste hierarchy, reduction of waste is the best mitigation tactic. North Somerset Council waste is generally disposed of via recycling and landfill. North Somerset council have a goal to divert all non-recyclable waste away from landfill by the end of 2022.