YOUTH INVESTMENT FUND

Youth Investment Fund's Environmental Impact

Julian Mellor, 2MD Regeneration

Foreword

Jack Wakefield, Head of Policy & Communications for Social Investment Business

Social Investment Business commissioned this report to assess energy efficiency interventions within a range of Youth Investment Fund projects. The findings demonstrate how the Youth Investment Fund supported a wide range of meaningful improvements to youth facilities: increasing energy security, improving comfort and usability, and strengthening organisations' resilience. Across very different projects, youth organisations were able to successfully include low-carbon technologies including solar PV, batteries and heat pumps while maintaining a focus on modern spaces fit for high-quality youthwork.

The learnings also highlight how centralised support and specialist expertise could further embed energy efficiency and resilience into capital investments, providing valuable insight for the design of future capital programmes from government and other funders. Unlocking energy resilience for the social sector remains a key priority for us at Social Investment Business. This learning is valuable as we continue to fund and advocate for energy improvements and we trust it will also prove to be a useful tool for any organisation considering energy efficiency within a major building project. We'd like to thank Julian Mellor and 2MD Regeneration for their research and support with this valuable report.

Young people at the opening of The Lowdown, Northampton, one of the youth centres featured in this report.

Introduction

Julian Mellor, Director, 2MD Regeneration

The Youth Investment Fund, of over £300 million, is funded by the UK Government and delivered by Social Investment Business in partnership with National Youth Agency, Resonance, and the Key Fund.

The Youth Investment Fund was developed to create, expand, and improve local youth facilities and their services in the out of school youth sector, to drive positive outcomes for young people, including improved mental and physical wellbeing, and skills for life and work. The ambition was to ensure every young person had access to quality youth services in safe, modern places, to have new adventures, make friends, explore their passions and gain skills for life.

Over the last three and a half years, 276 youth services have been built or refurbished, creating spaces by and for young people. By March 2027, these centres will reach 73,141 young people every week, with 48,236 additional young people accessing new or renovated spaces to learn, grow and belong.

To bolster capital funding, every youth service had a revenue grant to invest in youth worker and volunteer training, help with project management costs, and to establish stronger youth engagement programmes and youth work teams. Responding to need, Social Investment Business also developed a Central Support Offer to build resilience and strengthen youth services, providing expert help and training with governance, fundraising, finances, marketing, and peer learning.

Green Transition

Supporting the green transition across the UK is one of Social Investment Business's key strategic priorities. Given this, there was a focus on promoting sustainability for Youth Investment Fund investments. As a result, the Youth Investment Fund's environmental impact has been far reaching; with new facilities having better insulation, solar panels, air source heat pumps and battery storage; reducing bills, increasing sustainability, and helping organisations invest more money where it belongs: in young people.

Social Investment Business commissioned 2MD Regeneration to carry out a detailed review of the Youth Investment Fund's impact on energy efficiency.

This report's series of case studies outline what projects were able to achieve by investing in renewables and energy efficiency, as well as the challenges and lessons encountered along the way. This will help applicants for future funds to make more informed and greener choices.

Methodology

Social Investment Business produced a longlist of organisations who had carried out energy saving measures as part of their Youth Investment Fund project. This was narrowed down to 16 projects representing a range of sizes and, locations, as well as a mix of new builds and refurbishments. Eight organisations agreed to take part as case studies for the project.

Each organisation was sent a list of the points that the case study hoped to cover. As much information as possible was gathered from existing information held by Social Investment Business, planning application, BRUKL (Building Regulations UK Part L) documents, EPC (Energy Performance Certificates) and internet searches.

Each case study was then visited by the report's author in order to develop the best understanding of the project, clarify any information gaps and gather data on utility use. Information was gathered through a semi-structured conversation with the senior staff and those responsible for day-to-day management. As a result, this report reflects the knowledge and opinions of the grantee rather than the designer or contractor. The knowledge and expertise of each project regarding the energy performance of the building was very variable and sometimes reflected their primary focus on providing services for young people rather than the details of running the building.

Challenges

The aim of the project was to gather information from about the installations and measures undertaken together with before and after data to show the benefits of investing in energy conservation and renewables.

Some of the case studies were able to provide all the information. However, for many others the records were not obtainable, or the interviewee did not have sufficient knowledge or access to provide the information, or the project had encountered problems with installations, commissioning etc with the result that parts were not yet operational.

As a result, the case studies cannot provide a like-for-like comparison with each other. However, in this shortcoming they do reveal some of the real-life obstacles that exist to reducing the energy demands of buildings.

The Case Studies

- 1st Shelton Lock Scout and Guide Group, Derby
- 105th Sheffield (High Green) Scouts
- South Cheshire Amateur Boxing Club and Youth Club, Crewe
- Southmead Development Trust, Bristol
- The Cowshed, Projects4Change, Newcastle
- The Highlife Centre, Coventry
- The Lowdown, Northampton
- The New Lodge, SYA, Shrewsbury

Acknowledgements

Nathan Clarke, Richard Parkes, Kerry Williams, Rachel Thompson, Beryl Latter, Sam Garbett, Sharon Womersley, Lisa Braithwaite, Christabell Amoakoh, Kelly Coates, Tom Hague, Fran Gaunt, Sue Baker, Myra Johnson, Ruki Hashi, Sarah Clifford, Jack Wakefield, Thomas Crabtree, Madelaine Walker, Jennifer Preston, Katie Mason, Rohita Rayapati, Kate Rounce.

1st Shelton Lock Scout and Guide Group, Derby

360 Sinfin Avenue, Derby, DE24 9QX
https://1stsheltonlock.org.uk

Summary

New build Scout and Guide hut giving a secure long-term base that is highly energy efficient and should result in significant savings in operating costs.

Key Features:

Structure: Insulated Concrete Framework providing highly insulated walls

Solar: 40 solar panels generating approximately 15-20kWp

Clean Heat: Air source heat pump and underfloor heating. Ventilation and heat recovery unit.

Batteries: A single battery installed

Impact:

Performing even better than hoped and providing a much-improved setting. The group in its new building is now attracting increased numbers of young people.

Energy Performance Certificate (EPC)

-5 A+. This is better than the new build benchmark of 13 A.

1st Shelton Lock Scout and Guide Group Case Study

Shelton Lock is a suburb in the south of city of Derby. It takes its name from the lock on the Derby Canal which is now a cycle path. Close to green spaces further to the south, Shelton Lock is home to about 2,000 residents and also a new Scout and Guide hut that is achieving the Net Zero target. Youth Investment Fund Grant: £1,266,776.00 (New build)

The Building Before

The previous Scout hut had been brought to a site behind the local church in the early 1960s having previously been used by the military. It was single storey, about 200m^2 in size with a main hall inc. kitchenette, toilets and storage. It was heated by a gas boiler on a timer and fitted with fluorescent lights. It was very expensive to run due to its energy use but never got sufficiently warm. Water use seemed very high for no apparent reason given that it was only used in the toilets and kitchenette. Despite its shortcomings many people felt a nostalgic connection to the building.

Development of the Idea

The old hut was located on land owned by the local church. When the lease expired it became apparent that the church was only willing to grant short leases thereon so the hunt for a new location began. By the time that the Youth Investment Fund was launched the group had already found a site, owned by Derby City Council, and secured planning permission for the new building. The project was led by three of the group's trustees, Sue, Fran and Ralph who wanted a building that was as cheap as possible to run.

The building was given planning approval for use only as a Scout and Guide hut which thereby excluded other community uses. This was to protect the amenity of immediate neighbours.

Throughout development of the proposals and detailed design the objective of the group was to have a building that achieved the highest possible standard of energy efficiency.

Young people were consulted on the design in its early stages. They wanted a warm building and were keen to provide habitats and bird boxes. But apart from a few who mentioned climate change most didn't have the knowledge to push for environmental performance. Trustees and other adults were supportive of the design proposals so long as the building was fit for purpose.

A planning application was submitted in May 2021 with permission granted in April 2022. The application can be found on Derby City Council's Planning Portal reference 21/00845/FUL.

The Completed Building

Construction of the new building, named The Full Circle Centre, began in February 2024 and was completed in December 2024.

Measuring 229m^2 GIA over one floor, a similar size to the previous building, it comprises:

- A large main hall with storage
- A meeting room with storage
- Large kitchen
- Seven toilets
- Two storage rooms
- Plant room.

Externally there is a drive and car park at the front and a small, grassed area to the rear. The whole site is surrounded by security fencing.

The building was designed by Tim Oxbrough Architectural Services of Shelton Lock. A Quantity Surveyor (QS) was directly employed by the Scout and Guide group. Tendering was managed by the project team and the QS. A local contractor from Nottingham, Ipsum UK Ltd, was appointed to undertake the build. The contractor provided M&E design. Project management was seen as a collaborative effort involving the QS, architect, contractor and client.

The design team was challenged to produce a building that was as energy efficient as possible although no technical target was set (e.g. EPC rating, permeability etc). Net Zero was not, in itself, a driving factor in the design.

The building cost £1.2m and was entirely funded by the Youth Investment Fund. A VAT exemption was obtained for the construction costs. After completion of the contract the contractor was very good at coming back to fix any small problems. The building has achieved an EPC rating of A+ (-5), the best of all the case studies and thought to be the best of any building in Derby.

Fabric

The walls were constructed using Nudura ISF (Insulated Concrete Formwork) – lightweight rigid foam hollow blocks that are drystacked and then infilled with concrete. This is often used in Passivhaus construction. Nudura has u-values far exceeding building regulations. It can also be constructed very quickly; the walls of the building were constructed in less than two weeks enabling quick progression to other trades on the site.

A steel joist provides the main structure in the hall. Elsewhere the walls provide the structure with timber roof trusses. The floor is concrete.

Externally render is applied directly onto the ISF and internally the walls are dry lined. Protective panelling approx. 1m in height was retrofitted on internal walls to protect them from scuffs etc.

Windows are triple glazed. All are high level for security reasons. The only exception is a set of patio doors from the main hall to the garden at the rear.

Heating, Cooling and Ventilation

An 8kW air to water heat pump provides heat to the building (Samsung 8kW Gen 7 R290). Heat is distributed around the building by underfloor heating.

The temperature is set at 17deg. The heating runs 24/7 in order to maintain the temperature in the floor slab, otherwise it takes 48 hours from a cold start to reach the optimum temperature.

Ventilation is provided throughout by a MVHR system located in the roof space.

Lighting

LED throughout with PIR (Passive Infrared Sensors) in the toilets.

The main hall has an innovative ceiling array depicting the blue sky and providing daylight grade lighting into the room.

Renewables

There are 40 solar panels on three faces of the roof with an estimated rating of 15-20 kWp. In addition, there is a single FoxESS storage battery (assumed to be 6kWh).

Excess power from the solar panels is exported to the grid via the electricity supplier E.ON. It took more than the six-to-eight-week lead time for E.ON, the power supplier, to commission the exported power from the solar panels.

There is currently no active management of the renewables setup by the Scout group to ensure that optimum use is made of solar power, battery storage and cheaper night-time tariffs although this is something that is being explored. End of year statements from E.ON will be sufficient for the trustees to monitor performance.

There is a single EV charger mounted on the building. This is not currently connected to a payment system and is little used.

Appliances

Kitchen appliances (induction hob, oven and fridge but no freezer or dishwasher) are all A rated.

Power

The property has a 3-phase connection to the grid although very little imported power should be required. Power is supplied by E.ON. Smart meters are installed.

Energy Performance Certificate (EPC)

The EPC describes the building as ‘General Assembly and Leisure, Night Clubs, and Theatres’ and provides a rating of -5 A+. This is better than the new build benchmark of 13 A.

Water

All taps in the toilets are non-concussive (self-closing).

Run off from the roof is stored in a 17,000L underground tank and used for toilet flushing. The filters are cleaned every six months while gutter brushes help prevent leaves and debris entering the system. To date the water harvesting is resulting in very little use of mains water.

A large attenuation tank had to be provided for surface run-off from the car park.

Maintenance

All fittings have five-year service contracts. It is acknowledged that the longer term may involve repairs or replacement of some of the fittings of which there are many more than the previous Scout hut. Provision is being made in the group's finances for these potential future costs.

Outcomes

The building is performing even better than the group hoped.

The group has seen an increase in numbers attending their activities. A new Scout unit has started. Brownies are up 30%. A Squirrels group has started since moving to the new building. The more modern facilities have helped attract new people. It is also more visible and accessible.

They have also seen increased collaboration between the Scouts and the Guides groups especially with the sharing of resources, something that wasn't an objective, but which is very much welcomed, and which reduces duplication of and the amount of equipment and supplies purchased.

Future Plans

The group is hoping to develop greater use of the building in the daytime. Use by an additional provision provider for SEND children aged 6-10 is being explored although this will require relaxation of the planning user clause, for which permission is being sought.

Lessons

- Sound absorption boards to absorb echoes were installed but were not included in the original design. The amount of echo was not appreciated at the outset. They quickly needed to be sourced but were expensive (c.£18,000). The boards benefit both children and adults.
- Panels to protect the lower parts of the walls is important especially if there are lively activities. Tables also tend to get pushed to the walls which can cause scuffs.

- Attenuation tanks for surface run-off were required as a condition of planning – this had not been anticipated at the early design stages and cost about £28,000.
- Armoured cables for outdoor cable runs (e.g. to automatic gates) to prevent rodents chewing through them.
- Make sure the contractors pay for their use of your electricity.
- The planning permission constrains the use of the building to Scouts and Guides. This means that community use has not been possible without seeking a relaxation of the condition.
- An element of self-containment of parts of the building might have made it more flexible and allowed for other users at the same time as Scouts and Guides are in other parts of the building without compromising safeguarding requirements. This would have presented some additional challenges re access routes, booking systems etc.

Data

The table below summarises the BRUKL (Building Regulations UK Part L) report. The middle column shows the figure that the building should be achieving. For energy consumption and emissions this is theoretical calculation for a 'notional' building of the same size, shape, orientation and shading as the actual building, with the same activities, zoning and system types and exposed to the same weather data. The column on the right shows the calculated figure for Shelton Lock itself.

Performance u value (W/m^2K)	**Acceptable limit**	**Shelton Lock**
Walls	0.26	0.16
Floors	0.18	0.13
Pitched roofs	0.16	0.13
Windows	1.6	0.9
Doors	1.6	1.6
Air permeability	**Standard**	**Shelton Lock**
$m^3/(h.m^2)$ at 50Pa	8	15*
Energy Consumption (kWh/m^2)	**Standard (notional)**	**Shelton Lock**
Heating	16.82	12.86
Cooling	0	0
Auxillary **	26.78	15.21
Lighting	9.2	13.49
Hot water	1.55	2.18
Total	54.35	43.74
Energy & Emissions	**Standard (notional)**	**Shelton Lock**
Heating & cooling (MJ/m^2)	272.32	265.43

Primary energy*** (kWh/m^2)	81.16	-153.81
Total CO2 emissions (kg/m^2)	7.62	-13.24

* Buildings with less than 500m^2 of floor area can be exempt from air pressure tests in which case a figure of 15m^3/(h.m^2) at 50Pa must be used

** Controls, pumps and fans throughout the building

*** Primary energy is the energy from renewable and non-renewable sources at the place it is generated. For grid electricity this means that the figure will take account of losses during the transmission from the power station to the user. As a common example, each kWh of grid electricity used in a UK building requires 1.5 kWh of primary energy.

The EPC calculates lower energy performance with primary energy use of -39kWh/m2 per year and a building emission rate of -2.82kgCO2/m2 per year.

Energy Performance

A breakdown of recent energy consumption and generation is shown below:

	Jan – Dec 2025	**kWh/m^2**
A. Energy import (kWh)	8,606	37.6
B. Energy export (kWh) (Apr 25 to Feb 26)	5,541	
C. Net energy use (kWh) (A-B)	3,065	13.4
D. Solar panel generation (kWh) (Apr 25 to Mar 26)	9,850	
E. Approx solar use by building (kWh) (D-B)	4,309	
F. Approx total energy consumption by the building (kWh) (A+E)	12,915	56.4

The figures above can be compared to data for the old Scout hut from Feb 2021 to Feb 2022 when combined use of electricity and gas totalled approximately 11,000kWh or 56kWh/m^2. This is almost identical to the total energy consumption of the new building (although note that the new building has greater use and March export figures are missing). However, 75% of the new building's energy use is generated by solar panels resulting in net energy use of 3,065kWh or 13kWh/m^2. This is a considerable improvement and will result in significant reductions in the cost of energy. The new building is also much more comfortable.

Water Use

In calendar year 2025 water use was 7m^3. This equates to 0.03m^3 (or 30litres) per m^2 of internal floor area. Or 19 litres per day.

This compares to water usage in the previous building when 40m^3 was used from Sept 2019 to Mar 2020. That usage equated to 244 litres per day. The group noted that this seemed very high and suspected a leak in the system.

105th Sheffield (High Green) Scouts

Scout Hall, Pack Horse Lane, Sheffield, S35 3HY
https://www.105highgreen.co.uk/about-us/newhq/

Summary

Headline:

New build headquarters building that is very close to its carbon neutral target and with some tweaking should achieve it.

Key Features:

Solar: 48 solar panels generating 20kWp, fitted with optimisers to get the best output and with a roof pitch designed specifically for maximum solar gain.

Clean Heat: Fully equipped with air-to-air heat pumps providing heating, hot water and cooling as well as heat recovery units recycling heat from the building.

Batteries: 45kWh of battery storage. The Scouts are working to optimise the balance of solar power, battery storage and power imported from the grid.

Impact:

Electricity bills in the summer can now be nearly £0.

Net annual use of electricity from the grid is down to just 1,300kWh.

Since opening the group has doubled every section (Squirrels, Beavers, Cubs and Scouts) going from four to eight sections. The building is at capacity four nights / week and has Brownies on a fifth night.

Energy Performance Certificate (EPC)

-1 A+, better than the new build benchmark of 8 A.

Sheffield 105th (High Green) Scouts Case Study

The childhood home of the Arctic Monkeys, High Green is also home to a new HQ for Sheffield 105th (High Green) Scouts that has hit the Net Zero target. At the Sheffield Design Awards in 2024 the project was awarded the Judges' Special Award for Community Value and the People's Choice Award.

A Youth Investment Fund grant (capital and revenue) £1,842,374.00 for a new building.

The Building Before

The old Scout hut (c.170m^2 GIA plus external stores) had been built in the 1960s and had lasted much longer than its expected 30–40-year lifespan. It was essentially a giant timber shed containing a large hall, kitchen and toilets. But the timbers were rotting, there were vermin, it had no insulation and the windows were single glazed, so it was very cold and draughty. With the amount of heating required it had a large carbon footprint and was very expensive to run. To quote one of the Scouts at the time of the Youth Investment Fund application, "This is not a sustainable building". In addition, the layout of the building restricted the number of groups that could use the hut at any one time so there was no potential for growth or adaptation while an external store and shipping containers were needed for storage.

The hut had a gas combi boiler for heating and hot water, traditional radiators and strip lighting (which had been upgraded from fluorescent to LED).

Water use was for kitchen and toilets.

Development of the Idea

The group had spent 20 years looking for funding to replace the old hut. Through small scale fundraising events the Scouts had managed to save approximately £70,000 towards a new building. While this was significant it still fell far short of the likely cost of construction. Furthermore, the overall levels of deprivation in High Green were too low to secure the amounts required from many of the larger grant funds despite there being pockets of very high need.

An expression of interest submitted to the Youth Investment Fund was approved in September 2022. Detailed proposals still had to be worked up so the £70,000 could potentially be used for pre-construction design, surveys etc. However, there was a risk that this would be wasted if the final grant was not approved. Fortunately, in December 2022, the Youth Investment Fund released pre-construction grants thereby removing the risk and associated stress of losing the £70,000.

The design and tendering process was rapid with contractors on site by August 2023. This timescale was driven by Tom Hague, Assistant Group Scout Leader, who works as a project manager for a major construction company and therefore had the knowledge and expertise to know what was feasible for the design team.

Young people were involved in the design process, learning about funding, thinking about the good and bad points of the existing building, sketching out floor layouts for the architects, and thinking about end uses (although a McDonalds and helicopter pad were not adopted!). They wanted it to be better for the environment and to include a meeting room, a proper kitchen and outdoor space.

A planning application was submitted in March 2023 with permission granted in June 2023. The application can be found on Sheffield Council's Planning Portal reference 23/00832/FUL.

The Completed Building

Construction started in August 2023, and the building was completed at the end of May 2024.

The completed Scout HQ (443m^2 Gross Internal Area) provides:

Ground floor: Large (150m^2) double height hall with folding partition (thus allowing for two groups to be using the building at the same time), large (47m^2) double height garage store, toilets, kitchen, plantroom, storage
First floor: Large meeting room and storage.

Photo: Robin Farr

Tom Hague project managed the whole development process but given his limited availability during the day he was supported by another project manager for about 0.5 days/week who brought more experience of commercial contract management. The building was designed by Race Cottam Associates and Mechanical and Electrical (M&E) services were provided by Anderson Green.

The Scouts invited five companies to tender with four replying. The principal contractor was Sheffield based HP Construction appointed under a JCT Design and Build Contract. As they sub-contract all the actual construction works their overheads are lower than many others.

The design team transferred to the contractor but given the complexity of the building the Scouts retained the M&E designer to provide independent advice on the contractor's proposals and to inspect the installations. This additional cost had been factored in at the outset.

Over £1.8m was awarded to fund the development cost. This was entirely funded by the Youth Investment Fund. To bring the construction cost to a fundable level it was zero rated for VAT meaning that the building can only be used for relevant charitable purposes and, beyond a nominal allowance, cannot be hired out to commercial uses for the first 10 years. This curtails daytime use of the building and significantly limits the building's income to that which is given as voluntary donations via JustGiving. VAT still had to be paid on professional fees, surveys etc.

The architect describes the building as drawing "On the iconic ridge tent as a concept for the architectural form, symbolising shelter, adventure, and exploration". Internally the building design uses a lot of education specifications, so circulation spaces especially are more generous than many other buildings of similar use.

Fabric

Because of the area's history of coal mining and associated spoil heaps the ground conditions necessitated piling to a depth of 6m before the bedrock was reached. Concrete ground beams then gave the base for the steel frame.

The steel frame is infilled with cement particle board, insulation and stud wall on the interior. The exterior is faced with a combination of brick and standing seam roofing.

The roof includes steel purlins (the contractor's preference over timber) and the floors are concrete.

The air tightness target set by the design team was 3.0m^3/(h.m^2) at 50Pa. In the event, the building achieved 3.2m^3/(h.m^2) at 50Pa.

Heating, Cooling and Ventilation

All of the building benefits from air-to-air source heat pumps (i.e. air conditioning units that provide both hot and cold air). The units are either wall or floor mounted. The original design was for air-to-water heat pumps with underfloor heating but the cost of air-to-air was the same and has the added benefit of cooling during the few hot weeks of each summer. The electricity demand for cooling will probably be largely met by the solar panels so it will have minimal cost for the building. It also reduces the likelihood and security risk of windows and doors being opened for ventilation and then left open at the end of the day.

There are six heat pump units mounted on the south west face of the building with each unit supplying different parts of the building.

All the units are on a central control which enables timing, temperature etc to be set.

Mechanical extractors in the kitchen, WC and cleaner room operate during occupied hours only.

There are heat recovery units throughout the building, taking heat from the stale air being expelled and transferring it to the fresh air being imported. The air source heat pumps then add further heat to bring the air up to the desired temperature.

The building's optimum temperature is 17-18deg in the daytime and 19-20deg in the evening. The heating system switches off by 9 or 10pm when people are leaving. It will come on at 3am to put a little heat into the building while the tariffs are cheaper. Later in the day the temperature is brought up to the target for the 4-5 hours/day of evening activities. Ideally the system would be running 24/7 but given that the building is unused for up to 20 hours/day that would seem illogical. The project manager has experimented with both ways of heating the building (i.e. on/off and permanently on) and not found that there is much difference in energy use.

CO_2 sensors in each room detect the number of occupants, speed up the heat recovery units and increase the air change rate accordingly. When the main hall is at capacity the unit can get noisy but that might be reduced by fitting an attenuator to the ductwork. The CO_2 sensors are currently running 24/7 but this could be reduced to reflect the actual patterns of building's use e.g. from afternoon to 10pm. This will obviously reduce the building's energy use.

Lighting

LED lights are fitted throughout. All will turn off automatically. Some have absence detection but are turned on manually. Lights in other areas, especially circulation and toilets, turn on if they detect a presence. The only fully manual light is an external 100w lamp in the garden.

Renewables

On the roof there are 48 solar panels generating 20kWp. The pitch of the roof was designed at 30deg to get the maximum solar gain. Solar optimisers were fitted to get the maximum output from the solar panels even when some are in shade. The optimisers also record the performance of each panel and will notify if the performance of one drops off for any reason. This can be monitored through an app.

The inverter and battery system is supplied by SolaX. Initially five SolaX Triple Power Batteries were installed but recently a further three have been fitted providing a combined total of 45kWh of storage.

During the winter the system uses overnight grid electricity to charge the batteries to 100%. With longer days and more solar this % is being manually reduced (e.g. to 20%) so that the benefit of the solar is maximised. The building is not yet quite balancing its energy import and export (it is still at 700kWh net import per year) but adjusting the CO_2 sensors will help bring the balance closer to zero.

Last winter (2024/25) the initial five batteries would be charged to 100% overnight but by mid-afternoon the stored power had all been used by the heating system. The building would then switch to grid supply. The extra batteries will address this to some extent.

Outside there is one Electric Vehicle (EV) charger post with two sockets of 22kW each. As it is inside the compound it is not for public use. The Monta app manages the chargers' use via QR code. The charge is set at 30p/kW. Usage is limited as most people visiting live locally and those with EV cars can charge at home for much less.

Appliances

All kitchen facilities (dishwasher, fridge, freezer) are A or B rated.

Power

Initially provided by Ruby Energy but soon to transfer to Octopus who have a better export tariff.

Monthly bills do fluctuate considerably with winter electricity bills reaching £800/month while bills for summer use can be nearly £0.

Energy Performance Certificate (EPC)

The EPC describes the building as 'Non-residential Institutions: Community/Day Centre' and provides a rating of -1 A+. This is better than the new build benchmark of 8 A.

Water

Toilet handbasins have automatic sensor taps.

Hot water is stored in a Dimplex tank heated by air source heat pump with an immersion heater as backup. The tank takes approximately four hours to heat to 60deg from cold. A 20w circulation pump means that hot water is virtually on demand in the taps. The single tank was preferred to point-of-use heaters due to the greater efficiency derived from using the air source heat pump to heat the water (up to 300% efficient) rather than electricity (90% efficient).

There is an attenuation tank for surface water, discharging into an existing watercourse culvert. Foul water goes to the main sewer connection.

Water harvesting was not specified due to experience on other sites of them being great for five years but then failing due to a lack of maintenance and then not being used. Also, there is only limited water use on site so measures to reduce use were not a priority.

Usage is probably similar to the previous building as there are no showers, just kitchen and toilets although greater use of the building could mean usage has risen.

Maintenance

The building is managed by Tom and a supporting team. Appointing a single contractor to maintain everything would be prohibitively expensive so they have been selective about the maintenance contracts they award and limit them to the essentials e.g. fire alarms, gas levels in the air conditioning, lightning protection, PAT testing and other key safety systems. Cleaning filters, weekly fire alarm tests and other more routine tasks are carried out in-house with a tracker system to ensure they are completed.

A BMS (Battery Management System) was going to be installed but was eventually omitted as it wasn't going to be of sufficient value.

Outcomes

Since opening the group has doubled every section (Squirrels, Beavers, Cubs and Scouts) with an overall increase from four to eight sections. The building is at capacity four nights / week and has Brownies on a fifth night. Recruiting enough volunteers to run the sections is now the limit of further growth. There are a theatre group and a brass band that also use the building at weekends.

Tom sees the Net Zero target as a fundamental part of the Scout's offer to young people: "As a Scout group we want to be spending money on the kids so the cheaper our bills are the more we can spend on activities."

The building is very close to its carbon neutral target. With some tweaking (e.g. running the CO_2 sensors only when the building is occupied) it is hoped to achieve the target.

Future Plans

An AI bolt-on due to be launched by SolaX will learn the building's daily energy use patterns, look at the next day's forecast solar and temperatures, and calculate how much the battery needs to be charged overnight to maximise the benefit of off-peak energy tariffs.

The Scouts would like to take on a 10m strip of neighbouring scrubland so that more outdoor activities could take place but the local Council which owns the land is not responsive to enquiries.

Lessons

Mostly the project was very successful and was built to budget and delivered on time.

- Maximise the solar capacity especially if it is being grant funded. Fit optimisers to maintain the most power, minimise the impact of any shading and monitor performance.
- Maximise the insulation.
- Install air source heat pumps.
- Set a very stringent airtightness target of 3.0 or less.
- Once everything is installed make best of use of it. Have someone who understands the systems or use AI once that's available. If you don't understand it, you're not getting the benefits from the investment.
- Retaining the M&E designer on the client side was a good move and picked up on a few items proposed by the contractor.
- Cleanable paint was meant to be specified but was missed out. The walls are now starting to show handprints and scuffs so one day it will need to be redone with scrubbable paint.
- Sound absorption panels were fitted retrospectively after one of the Trustees found it hard to hear when the meeting room was full. The panels have definitely helped.
- There's a lot of expensive kit that will one day need replacing. Funds need to be put aside to cover those eventual costs.

Photo: Robin Farr

Data

The table below summarises the BRUKL report (Building Regulations UK Part L). The middle column shows the figure that the building should be achieving. For energy consumption and emissions this is a theoretical calculation for a 'notional' building of the same size, shape, orientation and shading as the actual building, with the same activities, zoning and system types and exposed to the same weather data. The column on the right shows the calculated figure for High Green itself.

Performance u value (W/m^2K)	**Acceptable limit**	**High Green**
Walls	0.26	0.15
Floors	0.18	0.12
Pitched roofs	0.16	0.12
Windows	1.6	1.3
Rooflights	2.2	1.4
Doors	1.6	1.2
Vehicle doors	1.3	1.3
Air permeability	**Standard**	**High Green**
$M^3/(h.m^2)$ at 50Pa	8	2
Energy Consumption (kWh/m^2)	**Standard (notional)**	**High Green**
Heating	12.8	7.41
Cooling	0.59	0.59
Auxiliary *	1.87	2.2
Lighting	6.29	4.47
Hot water	0.73	2.85
Total	22.29	17.52
Energy & Emissions	**Standard (notional)**	**High Green**
Heating & cooling (MJ/m^2)	137.99	120.89
Primary energy** (kWh/m^2)	33.52	-16.71
Total CO2 emissions (kg/m^2)	3.19	-1.28

* Controls, pumps and fans throughout the building

** Primary energy is the energy from renewable and non-renewable sources at the place it is generated. For grid electricity this means that the figure will take account of losses during the transmission from the power station to the user. As a common example, each kWh of grid electricity used in a UK building requires 1.5 kWh of primary energy.

The EPC calculates slightly lower energy performance with primary energy use of -6kWh/m2 per year and a building emission rate of -0.4kgCO2/m2 per year.

Annual Electricity Use

Annual electricity use in the new building is 20,600 kWh. Some of this is supplied by the grid and some by the solar panels and batteries. Annual electricity imported from the grid is 5,600kWh. The remaining 15,000kWh is generated by the solar panels.

The annual electricity export to the grid (i.e. the electricity generated by the solar panels that is not used by the building and is not stored in the batteries) is 4,300kWh. This means there is a net use of electricity from the grid of 1,300kWh.

The annual electricity use equates to approximately 46kWh/m^2/yr or 56kWh/day. The net import of electricity from the grid equates to 2.9kWh/m^2/yr or 3.6kWh/day.

Under the Octopus contract electricity will be exported at 11p/kWh. This will provide a payment of £473/yr.

Electricity Use in the Old Scout Hut

In the old Scout hut the annual gas use was 16,200kWh and annual electricity use was 2,614kWh. The combined gas and electricity energy use of 18,814kWh equated to approximately 110kWh/m^2/yr or 44.4kWh/day.

Water Use

Annual water use in the new building is 25.3 m^3. This equates to 0.057m^3/m^2/yr (57 litres).

In the old Scout hut annual water use was 68m^3. This is thought to be very high given use only for kitchen and toilets so could indicate there was a leak.

South Cheshire Amateur Boxing Club and Youth Club, Crewe

Summary

New build boxing gym and youth club that has transformed the club and provided a very energy efficient building.

Key Features:

Solar: 70 solar panels generating 30kWp

Clean Heat: HVAC unit providing heat, heat recovery, cooling and ventilation.

Batteries: A future aspiration.

Impact:

A massive improvement compared to the previous space in a cold Victorian warehouse. Significant increase in the number of young people attending and new partnerships with other local organisations.

Energy Performance Certificate

10 A. This is better than the new build benchmark of 15 A.

South Cheshire Amateur Boxing Club and Youth Club Case Study

Introduction

For many years South Cheshire Amateur Boxing Club has trained the young people of Crewe to box. Now, with a new energy efficient building, they are able to broaden their activities and work with many more young people and local organisations.

Youth Investment Fund grant: £820,622 (Capital and Revenue), plus additional funding from the UK Government's Towns Fund (£1,190,402, the Garfield Weston Foundation (£150,000), the Community Ownership Fund (£300,000), and the Improved, Greener, Communities Facilities Fund (£15,000).

The Building Before

For ten years the club operated from a large 180sqm space on the first floor of a Victorian warehouse in the centre of Crewe. The space was very basic. It had uninsulated brick walls, single glazed windows and an asbestos roof. Consequently, it was damp, mouldy and cold (the lowest recorded temperature was 6 degrees, and it was frequently colder inside than out). Also, when the club started their ten-year occupation at the warehouse it lacked any heating or hot water. They shared toilets with other tenants and there were no showers. The club installed its own infra-red heaters, although these were very expensive to run. Eventually the landlord received grant funding to insulate the ceiling and provide hot water and a shower. But while the space met very basic needs, it didn't provide a truly welcoming atmosphere for the town's young people. The size of the room also constrained the club to 40 young people at any one time, so there was no opportunity for the club to grow its activities.

Development of the Idea

Despite the warehouse's shortcomings the club had proved the demand for its services and their ability to generate income and cover their costs. They also had lots of good stories to tell about the difference they were making to people's lives. They just needed better premises.

Over a four-year period, the club developed a partnership with the trustees of Crewe Youth Club. In doing so they opened up the potential to develop a new building on a 1.1-acre site at Mirion St in Crewe.

From the 1960s, the Mirion St site had housed a youth centre, but it had closed in 2014 and was then destroyed by fire. The trustees were then unable to provide any youth provision and were also struggling to keep the derelict site secure.

Meanwhile, the boxing club had a strong history of provision, but no site upon which they could develop and grow. Recognising their compatible needs, the two organisations formed a new partnership and agreed that the youth club would lead on fundraising and delivering the development of a new boxing gym, while the boxing club would become the tenant and gym operator. This led to a complex relationship in which the details of the building's specification had to meet the needs of the boxing club but also be approved by the youth club as landlord.

A planning application was submitted in June 2023, and permission granted in October 2023. The application can be found on Cheshire East Council's Planning Portal reference 23/2182N.

The New Building

With funding secured, construction started in the summer 2023 and the building opened on 1 July 2025.

The new boxing club and youth club (658sqm Gross Internal Area) provides a large 350sqm gym up to 8m in height with two boxing rings, gym equipment on a mezzanine floor, a small office, kitchen, changing rooms, showers and WCs.

Externally there is a 30-space car park including four Electric Vehicle charging bays, large grass amenity areas and outdoor exercise equipment.

The building was designed by NC Architecture and built under a JCT Intermediate Building Contract by PGS Projects. Construction-Q were employed by the club for project management and quantity surveying. A pre-construction grant was provided by the Youth Investment Fund to help cover the upfront costs.

The building cost around £2m (inc. VAT) to build with funding from multiple sources (UK Government's Towns Fund (£1,190,402), the Youth Investment Fund (£820,622), the Garfield Weston Foundation (£150,000), the Community Ownership Fund (£300,000), and the Improved, Greener, Communities Facilities Fund (£15,000).). Construction took just under one year.

The environmental performance of the building was driven by a desire to minimise the building's running costs. During the design process conversations were had with many different people with experience of renewables and heating systems which eventually led to the final specification.

Fabric

The main structure is a steel frame while the external walls are made of blockwork and insulation on the lower part and insulated panels on the upper part. This was a variation from the initial design for blockwork for the entire height of the walls, but it was decided that sufficient performance could be achieved at lower cost with the panels. Externally all the walls are timber clad. Windows are double glazed throughout.

Heating, Cooling and Ventilation

The large gym space presented particular demands; it needed to be heated in colder months, kept cool in the summer, and ventilated throughout the year.

An early specification established that an air source heat pump for the building was going to cost £80,000. But in addition, a cooling system was likely to be needed together with air circulation/ventilation (trickle vents were the only non-mechanical option but these were unlikely to be sufficient).

To avoid the complexity and running costs of different systems for each function the engineers specified a heating, ventilation and cooling unit (HVAC) unit (costing £150,000) to fulfil all three roles. Externally located plant blows warm or cold air through the main parts of the building via expandable ventilation pipes. A mechanical ventilation with heat recovery (MVHR) system extracts the heat from the air that is being expelled and uses it to warm the fresh air being brought in. Air source heat pumps bring the imported air up to the required temperature. The total heating capacity is 40kW and the cooling capacity is 103kW.

In smaller rooms there are hot and cold air conditioning units.

Management of the heating system is still a work in progress with multiple visits required by the installers to adjust the setup. This is not unusual.

The first proposal was to have a building management system (BMS) that would run 24/7 but, with the building not yet occupied to full capacity, a manual system that can be remotely controlled to turn the heating and cooling on/off has proven more user-friendly.

Through the hot summer of 2025 the cooling system worked extremely well and was able to quickly reduce temperatures to the target level. When the winter came it transpired that the heating part of the HVAC was not working. Nevertheless, despite January temperatures in Crewe falling to -8deg, the temperature inside the building never fell below 8-9deg. This meant that the building was still very usable for physical activities despite the lack of any heating. The HVAC and heating were recommissioned in Spring 2026. The ideal heat for the boxing gym is 13-17deg so the heating will start-up when temperatures fall below 13deg. The optimum

temperature is still being explored but given that everyone is exercising and generating a lot of their own heat it could be less than 17deg.

Overall, the system is felt to be working well with the building retaining heat, cooling down quickly when needed and warming up quickly.

Lighting

Lighting is LED throughout. Passive infrared sensors (PIR) are fitted in the smaller rooms.

Renewables

There are 70 x HiMo6 420w solar panels on the roof (total c.30kWp). These power the building with surplus power exported to the grid. Due to budget constraints batteries were not included in the final build, although they had been included in earlier specifications.

In the car park there are two electric vehicle chargers, each with two sockets. As yet they are not operational as the installers have not provided the user card. Eventually their power demand will be managed so that the building's power use takes priority on the draw from the solar panels.

Power

The building was fitted with a three-phase electricity supply. However, the 400kVa capacity was over-specified and as a result the standing charge totalled £11,000/year. The capacity was reduced to 69kVa to bring the standing charge down to £800/year.

The pattern of electricity use is still emerging with data hampered by the lack of a smart meter and other teething issues. However, the January 2026 usage was 1,113kWh and the bills are expected to be £1300/qtr.

Energy Performance Certificate (EPC)

The EPC describes the building as 'General Assembly and Leisure, Night Clubs, and Theatres' and provides a rating of 10 A. This is better than the new build benchmark of 15 A.

Water

Point of use hot water heaters are installed for the toilet basins and kitchen sink. There are three electric showers, but they are not in daily use.

Surface water is discharged into soakaway crates below the car park. There is no water harvesting.

Foul water is connected to the main sewer.

Maintenance

The boxing club is responsible for the maintenance of the building. With the complexity of the building the number of maintenance contracts has been an administrative challenge.

Outcomes

Nathan Clarke, the Head Coach for South Cheshire Amateur Boxing Club, describes the new building as transformative for young people:

"It's more than a boxing club and it always has been. Look at it now; it's 3 o'clock in the school holidays, and I've got young kids in already. And they'll stay here until 7 or 8 o'clock tonight. We know they won't train and box for five hours. They just relax, talk with their mates. That's something we recognise, so upstairs we've got a PlayStation and that makes us a youth centre come boxing club. That's what we have to be; the reason we have got the building is to do that".

"For me a youth centre changed my life, so I have always said I don't just want this to be a boxing club. If there's a member of staff here or there's a coach here, a volunteer, then we're happy to take young people in. We don't want kids just to come in and just box. We don't want people to think "oh I can't go to the boxing gym because I'm not a boxer". That's nonsense. The building's uses are endless. We've just managed to get funding for eight laptops to help kids with IT skills etc. That's something not all boxing gyms do. We want to be able to take someone from unemployable to employable. We know that employers want punctuality, effort and

determination. That is everything that boxing provides. And if you don't want to box, then we've got the upstairs personal training".

At their previous premises the club had 300 signed up members and now has 1,000. It has 100 paid-up members on monthly subscriptions and additional 'pay as you go' young people. They frequently have 130 people using the facilities each evening.

Following the opening of the building multiple partnerships have been formed with local organisations. These frequently reach beyond a direct interest in boxing and instead look at the skills, fitness and resilience that the club can teach in the setting of the new building and its facilities.

Future Plans

Batteries will be installed. Boxing classes mostly take place in the evening, so the club would be able to make better use of the solar panels storing power in the day and using it in the evening.

Lessons

- Don't over-specify the three-phase power supply.
- Nathan's passion is teaching boxing but with the new building he is now more of an operations manager, paying bills, sending emails, dealing with suppliers etc. "Don't try to do it on your own. Build a very, very good team around you".
- Collaboration with other organisations has been a key to the project's success: "If we didn't collaborate with other organisations, we wouldn't be here. I've collaborated with about 15 different organisations all trying to do the same thing. We're just stronger as a unit rather than trying to do it on our own".
- With the new building, people take the club more seriously. They have to make sure that they maintain high standards and work with others who do likewise. But trust can be hard to win and maintain.
- Don't underestimate the administrative demands of numerous maintenance contracts. Gain as much knowledge as you can in advance and don't try to learn on the job.

Data

The table below summarises the BRUKL (Building Regulations UK Part L) report. The middle column shows the figure that the building should be achieving. For energy consumption and emissions this is theoretical calculation for a 'notional' building of the same size, shape, orientation and shading as the actual building, with the same activities, zoning and system types and exposed to the same weather data. The column on the right shows the calculated figure for the Boxing Club itself.

Performance u value (W/m^2K)	**Acceptable limit**	**Boxing Club**
Walls	0.26	0.15
Floors	0.18	0.14
Pitched roofs	0.16	0.12
Windows	1.6	1.4
Rooflights	2.2	1.5
Doors	1.6	1.4
Air permeability	**Standard**	**Boxing Club**
$M^3/(h.m^2)$ at 50Pa	8	5
Energy Consumption (kWh/m^2)	**Standard (notional)**	**Boxing Club**
Heating	8.84	9.8
Cooling	0.88	0.7
Auxiliary *	25.47	35.76
Lighting	13.31	19.66
Hot water	42.82	53.05
Total	91.32	118.96
Energy and Emissions	**Standard (notional)**	**Boxing Club**
Heating & cooling (MJ/m^2)	75.24	67.92
Primary energy** (kWh/m^2)	125.49	120.56
Total CO2 emissions (kg/m^2)	11.65	11.36

* Controls, pumps and fans throughout the building

** Primary energy is the energy from renewable and non-renewable sources at the place it is generated. For grid electricity this means that the figure will take account of losses during the transmission from the power station to the user. As a common example, each kWh of grid electricity used in a UK building requires 1.5 kWh of primary energy.

Data on electricity generation from the solar panels and the benefit of the batteries was not available.

In January 2026 usage was 1,113kWh. With $658m^2$ Gross Internal Area, this equates to $1.7kWh/m^2$.

Southmead Development Trust, Bristol

Greenway Centre, Doncaster Road, Bristol, BS10 5PY
https://southmead.org/greenrooms-new-spaces-to-hire

Summary

Headline:

Refurb of two separate buildings; the Greenrooms and The Ranch.

Key Features:

Solar: Greenrooms: 25 solar panels generating 11.2kWp. The Ranch: 28 solar panels generating 12.6kWp.

Clean Heat: Greenrooms have air-to-air heat pumps providing heating and cooling, and a separate ventilation unit. The Ranch has optimised its use of an existing gas boiler.

Batteries: Greenrooms: 3kWh of battery storage. The Ranch: 10kWh of battery storage.

Impact:

At the Greenrooms, where recording of energy use is combined with the rest of the site which has had significant investment in solar panels and insulation, there has been a 25% cut in gas use and only 4% increase in electricity use.

At The Ranch there has been a 30% reduction in gas use and a 38% reduction in electricity use.

Both sites now have much more comfortable spaces and are attracting increased use.

Energy Performance Certificate (EPC)

Greenrooms: 64 C
The Ranch: 60 C

Southmead Development Trust, Bristol Case Study

The Greenway Centre in Southmead, Bristol provides a wide range of community and health services to local residents. As well as space for meetings, events, training, conferences and community support the centre hosts the Greenway Gym, Cafe Des Amis, the Greenway Business Centre, Greenway Community Learning, Greenway Care Connect, and Avon & Wiltshire Mental Health. The site is managed by Southmead Development Trust.

The Trust provides both open access and targeted youth work but the nature of the work and the children accessing it means that the two types of activity need separate spaces. Consequently, the project covers two sites: The Greenrooms is a youth and wellbeing hub where targeted youth work takes place, often via talking therapies, and The Ranch adventure playground which provides open access youth activities.

Youth Investment Fund grant: £2,805,844.00

Greenrooms

The Building Before

The Greenway Centre occupies the old Greenway Boys School. Built c.1950, Greenway School was typical of an era when energy was cheap and little attention was paid to insulation and energy efficiency. The school closed in the 1980s, since when it has been in a range of community uses.

The Greenrooms (277m^2 Gross Internal Area) had originally been the school canteen. It was a single storey building, generally attractive and well-proportioned in a late art deco style with a water tower to the north and a large basement. It still had the original steel single glazed windows many of which were rusted and warped meaning they could not be properly closed and were very draughty. The roofs were failing and leaking, and it was generally difficult to heat making it cold in the winter.

The basement contained the original and enormous oil-fired boilers that heated the entire site via a network of underground pipes. As part of piecemeal attempts to improve the building a biomass boiler had at some point been installed as a more sustainable alternative, but this only worked briefly and was eventually replaced with a gas boiler.

The electrics were dated with old fluorescent lights throughout.

Energy management was no more than switch-on the heating in the autumn and switch-off in the spring. There was no sub-metering of the building for electricity, gas or water and instead all were metered as part of the whole site.

The most recent use of the building had been as a nursery until December 2023.

The building had an EPC rating of 34 B. Given the state of the building this seems better than expected but was probably influenced by the biomass boiler being operational at the time of inspection.

Development of the Idea

The Trust had carried out a condition survey of the building, but the costs of repairs were too high to be economical and could not have been funded by income generated by the space. The Trust was therefore considering demolition and selling the site for housing.

Then the Youth Investment Fund was announced. This created a significant opportunity to secure a permanent home for the Trust's youth wellbeing services. The Trust had already developed a social prescribing offer which was being sold to GP practices but the only space to do the work was in the main Greenway Centre which still had the original classroom layout and was predominantly a business centre. Consequently, it had an institutional feel and was not the right environment for the young people likely to access the service. Instead, there needed to be a child-centric therapy focus to the space. This informed the planning and interior design.

The overall objective was to create a modern, accessible and energy-efficient facility designed to support young people, families and diverse community groups.

A planning application for a certificate of lawful development was submitted in April 2023. This sought confirmation that proposed replacement of the windows, improved access, boundary fencing and upgrade of Mechanical & Electrical (M&E) services was permitted. Certification was granted in June 2023. The application can be found on Bristol City Council's Planning Portal reference 23-01689-CP.

The Youth Investment Fund grant was given final confirmation in Autumn 2023.

A second planning application in May 2024, reference 24-02138-F, sought consent for improved access and brise soleil[1] on south facing windows. This was granted in July 2024.

The Completed Building

Works started in mid-2024. Initial demolition work was intended to clear out the basement and make it accessible for the main works contract which would convert the space to a boxing gym. But multiple expensive-to-solve problems were discovered so it was eventually decided to abandon this area with the gym instead being installed in the old shower rooms in the main Greenway building. The Greenrooms scheme was then redesigned. The basement is now outside the thermal envelope and is only used for building services.

[1] Brise- soleil translates as sun breakers – a devise that reduces a building's heat gain by deflecting incoming sunlight.

The architects were Kendall Kingscott of Bristol. Project management was provided by a specialist project manager recruited by and contracted directly to the Trust.

A lot of the enabling work was done outside the main contract by local contractors managed by the project manager. This accelerated the overall timeline to meet the Youth Investment Fund requirements. The main contract was awarded to Bristol contractor Bray & Slaughter and after starting in 2024 took 37 weeks to complete. Overall, all the works took one year and were completed in May 2025.

The completed building (294m^2 GIA (Gross Internal Area) according to the new Energy Performance Certificate) comprises a large multi-use hall, adjacent kitchen with servery, a number of therapy and activity/meeting rooms, and toilets. Therapy rooms are designed to NHS standards to ensure that they can be hired to organisations in the health sector by complying the requirement for four people to sit comfortably.

The development cost was £1.46m (inc VAT). The cost was almost entirely funded by the Youth Investment Fund.

Feedback on the design came from parents and the therapy sessions. There was a special session with the architects and young people on interior design. However, there was no input from young people on the environmental performance; instead, decarbonisation and modernisation were a strategic aim for the building.

Fabric

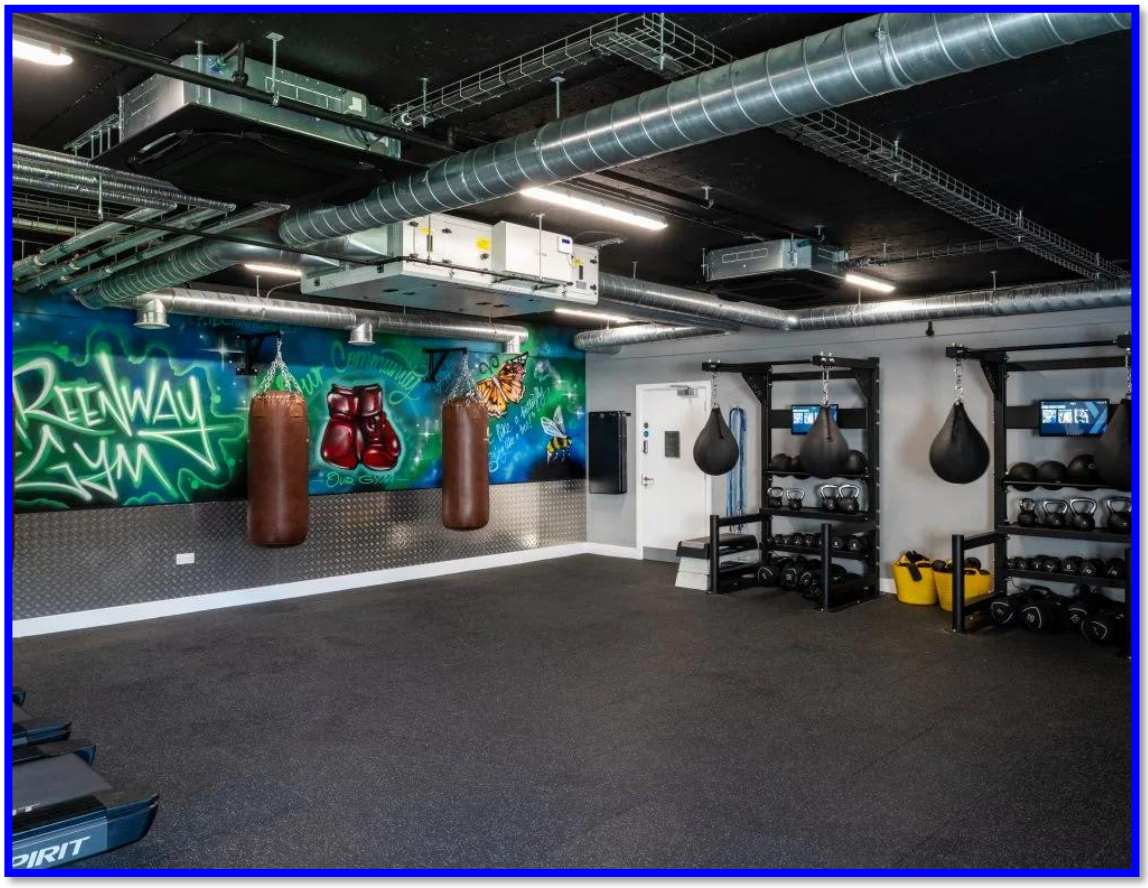
The original external brick cavity walls were retained. The cavities were insulated. Internal faces were drylined and 100mm rigid insulation added.

The ground floor above the basement was also insulated as the basement is outside the thermal envelope.

The roof covering was replaced and a new 'warm roof' system installed including in the roof of the water tower. Rainwater goods were updated to improve weather protection.

Internal walls to the therapy rooms have acoustic insulation.

New windows throughout are double glazed and argon filled.



Heating, Cooling and Ventilation

Heating is provided by Samsung DVM S2 and DVM S Eco 21.7kW air-to-air source heat pumps. Heat is distributed by air conditioning units which can provide cooling as well as heating. To date the running cost is perceived to be lower than anticipated (see data section below).

Ventilation by a 26.5kW mechanical ventilation and heat recovery unit is separately provided. The capacity of the ventilation unit limits the maximum capacity of the main hall to 60 people.

Although the room as originally designed could seat 100 people the cost of increasing the capacity of the ventilation unit was prohibitive. As a result, the size of the hall was reduced. The ceiling ducting required by the ventilation unit meant that the hall's room height had to be reduced quite considerably.

A central monitoring system sets the temperature for the building, but it can be adjusted in each room to a maximum temperature of 22deg and a minimum of 17deg.

Lighting

Throughout the building there is LED lighting with passive infrared sensor controls.

Renewables

There are 25 x 450w solar panels generating 11.2kWp.

The battery has 3kW of storage. There were multiple views on the best system to buy to achieve a system that could make the most of cheap tariffs.

The water tower houses the solar storage batteries and inverters.

Appliances

All fittings are A rated.

Power

The Trust recently moved from Ecotricity to Octopus for power supply, price being the main driver.

Energy Performance Certificate (EPC)

The EPC describes the building as 'Non-residential Institutions: Community/Day Centre' and provides a rating of 64 C. This is lower, in terms of performance, than the existing stock benchmark of 43 B and lower than the previous EPC for the building.

It had been hoped that the building would achieve a rating of B. When the recent EPC was carried out the building wasn't quite finished, so it didn't perform as well as hoped. However, the energy costs have been manageable – it is easy to avoid heating parts of the building if they're not in use.

Water

The building is fitted with dual flush toilets, non-concussive (push button) and aerated taps.

Maintenance

The building is managed by the Trust's Operations Manager. Routine maintenance of the building has been added to the existing maintenance programmes for the rest of the site.

Outcomes

The building has been saved. People love the hall which is mainly used for events and helps generate the income to pay for the rest of the building. Southmead lacks a village hall type facility that is available for hire, so the hall is going to fill that gap.

There have been lots of community cook-ups. Young people are going to be putting on their own events.

The feedback is that the building feels soft and safe.

Lessons

- The lesson from attempting to include the basement in the scheme is that when an architect says, 'this is an ambitious project' that is code for 'I don't think you should do this!'.
- The Trust employed their own project manager. The Trust was able to get advice on recruitment of the project manager from other construction professionals that they were working with on other projects. Recruitment presented a number of challenges as the speed of appointment challenged the Trust's established recruitment and procurement policies which needed to be flexed. The appointment was extremely successful and enabled the project to move very quickly with improved outcomes.
- It is important to get independent advice on the energy system. Architects and engineers may have their preferred system and specification, but it may not be the best for every project. Southmead was lucky that their project manager also worked in the sustainable energy department at a local university.
- When the installers are showing you how a system works, film them on your phone. That film will be much more useful than written notes, photographs or the manual.
- Get the business plan sorted in advance to ensure that the building can support the intended uses and users. Have a very strong vision about how the space will be used. There was up to a year of lag between completion and getting strong use of the building. Other staff on the site could have been involved in the launch much earlier so that everyone was aware of what was available.
- Time was wasted in the early stages so start as soon as you can and act like you're running out of time from day one.
- Be careful of items being accidentally dropped from the specification.
- Make sure that there's plenty of storage – there's never enough.

Data

As the works were a refurbishment a BRUKL report (Building Regulations UK Part L) did not have to be produced.

The EPC provides:

Building emission rate (kgCO2/m2 per year): 25.18
Primary energy use (kWh/m2 per year): 260

Electricity and gas are metered across the whole site with no sub-meters for individual buildings. It is not therefore possible to show data for the Greenrooms alone. However, a rough analysis of site-wide data shows a potential benefit from the changes to the heating system at the Greenrooms.

The ideal comparison would be between data for 2023 (before the construction works when the Greenrooms was operating and being heated by gas) and mid 2025 onwards (when the Greenrooms was operating again but heated by air source heat pumps). One would expect to see a drop in the site-wide kWh of gas use, resulting from the Greenrooms conversion to air source heat pump, and a smaller rise in kWh of electricity use (given the greater efficiency of the air source heat pumps at turning power into heat).

The data available does not cover the ideal period, plus there are many other potential variables across the rest of the site including investment in insulation and double glazing. However, comparing data for 22/23 with that for 25/26 shows a drop in gas use across the whole site of c.25% (100,000kWh) while electricity use between the latter part of 24/25 (May-Jan) and the latter part of 25/26 increased by only 4% (5,000kWh). If this is maintained it will bring a significant saving to the Trust.

The Ranch

The Ranch is located about a quarter of a mile east of the Greenrooms. With an adventure playground and indoor spaces, it provides open access activities for young people.

The Building Before

The adventure playground was first established in the 1950s. As well as climbing and play structures the site included a single storey building (234m^2 Gross Internal Area) which accommodated a social room, art room, kitchen, showers, toilets and youth worker office.

The building had benefitted from piecemeal improvements over the years. The buildings and playground were further improved in 2022 by the BBC's DIY SOS when a music studio and bike workshop were created in shipping containers.

The main building had three separate heating systems: a large overhead hot air system, a hot water boiler for showers and a boiler for the kitchen. The kitchen also had a gas stove. Heating to the studio was electric.

The shipping containers were damp and leaking to the point that they couldn't really be used. The internal configuration of the recording studio was difficult. The bike workshop is unheated.

Lighting was a mixture of LED and older fittings.

The building had an EPC rating of 57 C.

Development of the Idea

There were no critical or structural problems with The Ranch building, so it didn't need a fundamental rethink, but it did need corrections and improvements. In particular the building was very energy inefficient with significant gas use for heating.

The music studio had provided proof of concept, but it was an awkward space; something of a corridor with a studio room at the end.

Showers were not needed so these were converted to storage.

There was also work to the adventure playground next to the building. The existing youth building in centre of Southmead had closed with an agreement that youth services should be consolidated on The Ranch site. However, The Ranch was mostly catering for Key Stage 2 and 3 children and not for young adults. A stroke of genius came when it was realised that the older cohorts were very happy with the existing provision of equipment, but their use was hindered by younger children playing on it. New investment was therefore made into equipment for children

up to the age of eight thereby freeing up the existing equipment for older cohorts. This strategy has worked really well.

Young people provided ideas on the new facilities to be provided as did a parents group. There was a lot of interest in accessibility and to this end an access report was commissioned. The music studio user group inputted to the design of that space which is now much more usable with segmented booths. Young people did not drive the environmental improvements.

A planning application for a lawful development certificate was submitted in May 2023. This sought confirmation that the proposed upgrades to existing access, upgrade to the heating, and internal reconfiguration of The Ranch building. Certification was granted in June 2023. The application can be found on Bristol City Council's Planning Portal reference 23-02057-CP.

The Completed Building

Construction started in mid 2024 and was completed in mid 2025.

The works were split into small contracts that were sequenced to fit with the programme at the Greenrooms. This was all managed by the project manager employed by the Trust to manage both sites.

The development cost was £0.32m (inc. VAT). The cost was almost entirely funded by the Youth Investment Fund. Works included new apparatus installed outside.

Fabric

In the building the doors were improved, some new double-glazed windows installed, and cavity wall insulation installed in the block walls. But otherwise, the fabric of the building remained much as it was.

The bike workshop and music studio in the shipping containers had significant upgrades because they were so damp. 50mm Earthwool insulation was added to the walls behind a plywood facing. Externally the containers had slatted cladding added to the north wall. A new roof was added over the containers with 120mm insulation.

Heating, Cooling and Ventilation

Heat pumps were in the original plan, but these would have sought to maintain a certain temperature in the building throughout the day regardless of the fact that it is only used in the evenings. Furthermore, the building falls far short of the air tightness needed for air pumps to work efficiently. The mechanical & electrical (M&E) engineer advised that it would be more effective to retain an efficient gas boiler setup which would last for the next 10-15 years rather than move to air source heat pump at this point in time.

The showers and two of the boilers were decommissioned with the existing 36kW combi boiler now used to supply the kitchen, art room and newly installed radiators. The electric heaters in the music studio remain unchanged.

The only energy management is the thermostat.

Lighting

Most of the rooms already had LED but where needed they were upgraded.

Renewables

28 x 450w solar panels (12.6kWp) were installed on the container roof. In addition, there is a 10kw Sunsynk Inverter and Sunsynk 10kw Battery. Supply and installation cost approximately £20,000 inc. VAT (early 2025).

Power

Octopus is now the electricity provider.

Energy Performance Certificate (EPC)

The EPC describes the building as ‘Non-residential Institutions: Community/Day Centre’ and provides a rating of 60 C. This is slightly better than the existing stock benchmark of 68 C.

However, it is slightly worse than the previous rating despite the solar panels, battery and new insulation. This could be explained by changes to the grading in 2022 which now penalises gas heating.

Water

With the rationalisation of the boilers the hot water supply is now more energy efficient but there have not been any particular innovations regarding water conservation.

Maintenance

The Trust's Operations Manager is responsible for management of the building and its energy use.

Outcomes

Attendance at youth sessions has increased from 30-40 young people to 60-70 and the building is in use six evenings per week. This is in part because a better team has been built, youth engagement is better, and management staff can spend more time supporting the team rather than attending to the building.

Future Plans

Users need to be trained to manage the building in an energy efficient manner (the building is hired out to other youth providers).

Lessons

- There was a risk that by undertaking improvements to two sites simultaneously the project would lose sight of some the minor improvements on the smaller site. A dedicated champion for The Ranch on the project board might have helped ensure that the site wasn't accidentally overlooked.
- In the long run the savings from energy efficiency will pay for other upgrades and equipment at the site.
- In retrospect the Trust could have asked some of the organisations that hire the site to contribute to some of the costs especially when the Trust's own funds were having to be used. Amounts might not have been significant (e.g. £500) but they could have paid for items like lights or shelving.

Data

There was no BRUKL (Building Regulations UK Part L) report produced.

The EPC provides:

- Building emission rate (kgCO2/m2 per year): 23.43
- Primary energy use (kWh/m2 per year): 139

Compared to the year prior to the improvements to the building there was a reduction in gas use from 43,000kWh to 30,000kWh (30%) and a reduction in electricity use from 12,000kWh to 7,500kWh (38%). This is despite increased use of the building.

With a floor area of 234m2 the combined electricity and gas use is 160kWh/m^2/yr.

Projects4Change, Newcastle

The Cowshed, Houghton Avenue, Newcastle upon Tyne, NE5 3UT
https://www.projects4change.org/projects/the-cowshed/

Summary

An eco-conscious new build, known as The Cow Shed, which was led by the needs of young people and provides strong connections to nature. High ambitions for environmental performance have still to be achieved.

Key Features:

Solar: 8 solar panels generating approximately 2-3kWp

Clean Heat: Electric radiators. Air source heat pump providing hot water.

Batteries: A single battery installed

Impact:

The Cowshed provides a significant increase to the capacity of Projects4Change and gently responds to the needs of young people. But its energy performance is still to be established.

Energy Performance Certificate (EPC)

16 A. This compares to the new build benchmark of 13 A.

Projects4Change Case Study

Projects4Change is a small neighbourhood charity in Cowgate, an area of high deprivation in north west Newcastle. The charity develops youth-led projects to help address the needs and voices of under-represented and disadvantaged young people. From very humble beginnings it has been driven by a passion for its mission and the young people it supports, combined with creative and environmental agendas. It has now grown with the development of a new base, the Cow Shed, that Kelly Coates, the CEO, describes as “a dream come true”.

Youth Investment Fund Grant: £872,382.00

The Building Before

Projects4Change was formed in 2018 and in 2020 moved onto a 725m^2 (0.2 acre) site leased from the Council next to the Cowgate Community Centre. The site was a semi-derelict and dumped-upon allotment that had to have a lot of clearance work before it was usable.

Projects4Change bought a 26m^2 Gross Internal Area (GIA) shipping container for £16,500 that allowed them to start operating on the site. When talking to local people about what they would like to see the project provide, many of them said they wanted Betty's Hut back – a reference to a previous venture in the field next door that was run by a lady named Betty. The container opened as Betty's Hut at the end of the first lockdown in July 2020 and Betty herself became the project's patron.

The container was fitted out with a large activity space, kitchenette and toilet.

From the outset Betty's Hut was popular. Even before they had electricity and running water, up to 40 young people would be coming to the site. Despite having to bring in bottled water and use the neighbouring community centre for toilets they have fond memories of those early days. And young people kept coming. "As soon as we had the container it was already too small" remembers Kelly.

As well as its limiting size the container was not a flexible space. It wasn't possible to sit in a circle, and it wasn't possible to use it for drama (an important activity in the group that brings diverse parts of the community together and builds trust between them). With no insulation it was also hard to keep warm with energy hungry blow heaters, all of which had to be turned on in the winter.

Development of the Idea

By 2022 Projects4Change was still a small and relatively new project so they never really thought that they would get major funding. At best they thought they might be able to fund a tipi or another shipping container. So, when the Youth Investment Fund was announced they grabbed the opportunity and immediately started to think bigger. The first idea was to build units off-site and bring them in, but it didn't feel right for the site or the project.

The first consultation events with young people were run by Unfolding Theatre who had worked with Projects 4 Change since 2019. They were asked to lead a discussion around the campfire about what young people thought the building should include, what the project needed, why they come to Betty's Hut, why the space was important, and what they might need from the new space that they didn't currently have.

Unfolding Theatre introduced the project to one of their trustees, architect Tim Bailey of xsite architecture in Newcastle whose approach "is focused on people, the people who commission buildings, the people who use those buildings and the people whose environment is changed by our buildings". He initially worked for free with a passion for the project and a real understanding of the community, what they were trying to achieve and the values and ethos of Projects4Change.

Projects4Change also engaged with two academics, Armelle Tardiveau and Daniel Mallo, from Newcastle University School of Architecture, Planning and Landscape who specialise in engagement with the community and shaping spaces for people. They held several sessions where young people created pocket diaries showing what they loved about coming to Betty's Hut, and what their hopes were for the future and the new building. They created a mock-up of the building using wooden pallets to make walls and doorways together with actual seating areas. This helped young people visualise the space so that feedback on the design could be sent to the architects. For a long time before the build actually started the young people would carry on using the space they'd created with the pallets, having cups of tea, imagining they were in the new building!

The first consultation around the campfire was a place where all the different young people, irrespective of whether they would normally sit next to each other in other settings, were welcomed and came together. This dynamic was identified during the design process and as a result the main communal room adopts the round shape of the campfire. Because it is at the far end of the building it signals that people have tried to reach it, want to be sociable and are therefore welcomed. "Everyone has a seat at the table, and everyone knows that this is a space for everyone".

Jen Bernard Interiors, a prestigious consultancy mostly working with high-end properties, donated their time to help young people use their talents and guide them in the process of designing the interiors. Young people chose all the furniture, which was donated to the project, and decided on the colour palette. Some young people wanted skylights so that they could see the stars which the designers complemented with luminous stick-on stars on the ceiling. And the architects created a tree mural with young people adding their names to give a sense of belonging. During the process young people also learned to adapt when the need arose such as when Building Regulations ruled out the use of shingles on the outside of the building or when they wanted every colour of tile but then realised that that was never going to work.

A planning application was submitted in March 2023 and permission granted in December 2023. The application can be found on Newcastle City Council's Planning Portal reference 2023/0358/01/DET.

The Completed Building

Construction started in April 2024, and the building was completed by December 2024.

The building, named the Cow Shed, was designed by xsite architecture of Newcastle. The Quantity Surveyor was Todd Millburn of Newcastle. The main contractor was Aston Walker of Gateshead.

The Cowshed is located at the far end of the existing garden. The building (107m^2 GIA) provides:

- A spacious hallway including a nook and window seat
- Large community room with fitted window seats
- Kitchenette
- Toilets
- Storage

The building is full of daylight and feels very naturalistic. The window seats provide views into the natural setting. The spaces meet the needs of young people at different times. There are spaces to come together, spaces to decompress, spaces to connect with nature, and spaces to be sociable.

Externally there are seating areas adjacent to the building. The remainder of the site continues in its previous uses.

The Cowshed was designed to be energy efficient with a stated target to exceed Building Regulations by 20%.

The development cost was £718,000 (inc. contingency and fees, excl. VAT). The cost was entirely funded by the Youth Investment Fund. The construction cost was zero rated for VAT.

Fabric

Foundations were due to be ground screws with suspended timber floor.

The building has an insulated timber frame construction. Internal walls are panelled with plywood or drylined. External walls were to be clad with shingles, but this was rejected by Building Regulations due to the fire risk. Instead, they have been clad with Sinusoidal coated corrugated sheet.

Windows are double glazed.

The green flat roof has skylights into the community room and hallway. Sedum trays provide the growing medium on the roof.

Heating, Cooling and Ventilation

The building was due to be heated by an air source heat pump. However, issues with the final specification meant that this did not happen and instead the building is heated by electric radiators.

There is no cooling system. Ventilation is natural.

The installed air source heat pump is used for hot water only.

Lighting

In the daytime the building has good natural lighting from the roof lights.

There are LED uplighters in the community room.

Renewables

There are eight solar panels on the roof. The generating power is not known but assuming 350w/panel it is estimated at 2.8kWp.

A battery energy storage system is being installed.

Services

Broadband is being installed but needed a new telegraph pole which has taken a long time.

Power

Scottish Power supplies the electricity on a standard tariff.

Water

An air source heat pump supplies hot water.

Low water use fittings were specified.

Energy Performance Certificate (EPC)

The EPC describes the building as ‘Non-residential Institutions: Community/Day Centre’ and provides a rating of 16 A. This is marginally below the new build benchmark of 13 A.

An earlier EPC assessment had given the building a poor grading which the designers wanted to address. Problems are thought to have related to permeability tests (there were gaps in some of the ceiling structure which have now been addressed) and the installation of electric radiators which necessitated the installation of the energy batteries.

Future Plans

Betty’s Hut will be converted to a staff office.

Possibly taking on the management of adjacent scrubland to manage habitats and create spaces for young people.

Lessons

- The creative involvement of young people in the design process from early stages to detailed fitout can lead to insightful and innovative buildings.

- The building had the sustainability of materials and its long-term use at its core. However, attention needs to be paid to technical specifications to ensure that initial aspirations are included in the final works.

- Early specification of materials needs to have regard to compliance with Building Regulations especially regarding fire risks.

- The electricity bill when the contractors were on site was £2,500. This had to be funded through grants and meant the money couldn't be used for other purposes more directly benefitting young people.

- Setup all the financial processes before starting the build.

Data

It has not been possible to obtain the BRUKL (Building Regulations UK Part L) report for the Cowshed. However, the Design and Access Statement submitted with the 2023 planning application set out to exceed Building Regulation standards by 20%. Specific energy targets are set out in the table below. The middle column shows the u value that the building should be achieving. The column on the right shows the designer's target for the Cow Shed.

Performance u value (W/m^2K)	**Acceptable limit**	**Cowshed (target)**
Walls	0.26	0.14
Floors	0.18	0.15
Flat roofs	0.18	0.14
Windows	1.6	1.4
Air permeability	**Standard**	**Cowshed (target)**
$M^3/(h.m^2)$ at 50Pa	8	3

EPC data

Building emission rate (kgCO2/m2 per year) 8.39
Primary energy use (kWh/m2 per year) 86

Electricity Use

In the year to April 2022 Betty's Hut used 2,970kWh of electricity. This equates to 114kWh/m^2/year.

In the year to December 2025 Betty's Hut and the Cowshed used 6,246kWh of electricity. The combined floor area of the two buildings is 133m^2. The electricity use therefore equates to 47kWh/m^2/year. Daily use obviously varies significantly but an average for both the buildings over the year is 17kWh/day.

Currently the use of electric radiators and a dedicated air source heat pump to heat a small amount of hot water will lead to high electricity consumption.

It is not yet clear whether the solar panels are contributing to the Cow Shed's energy use. Once the battery storage is installed the inverter should be able to show the total energy use of the building, the import from the grid, the export to the grid and the amount of power used to charge the battery. Adding the energy import to the total solar generation and then subtracting the energy export will give the net energy use by the building.

Water Use

From April 2024 to March 2025 the building used 44m^3 of water. This equates to 0.41m3 (410 litres) per m2 of internal floor area per year. Or 120 litres per day.

Note that this time period included the construction period to December 2024 which will have increased normal water consumption.

The Highlife Centre, Coventry

WAVA Hall, 31 Barras Green, Coventry, CV2 4LY
https://www.thehighlife.org

Summary

Refurb of existing multi-use community building.

Key Features:

Solar: 26 panels with net capacity of 13kWp

Heat: Gas powered central heating replaced with electric radiators.

Batteries: 17.5kWh of battery storage

Impact:

What was a cold, dark and damp building is now considerably improved and attracting increased numbers of young people.

Energy Performance Certificate (EPC)

Not assessed since completion of the improvements. Previously 153 G.

The Highlife Centre, Coventry, Case Study

The Highlife Centre is a charity established in 2010 to empower individuals and communities with tailored support, resources and programmes that foster personal and professional growth. Its Youth Vision programme encourages and supports young people to take an active role in their communities with a focus on empowering them to realise their potential as community leaders and change-makers.

The building occupied by The Highlife Centre was in extremely poor condition. The Youth Investment Fund grant has modernised the building and brought it up to a higher standard.

Youth Investment Fund Grant: £432,571.00

The Building Before

WAVA Hall (325m^2 GIA) is located in Upper Stoke to the east of Coventry city centre. The hall was built in the 1960s for community use and until c.2019 had been a day centre for the Alzheimers Society.

The building is single storey. Internally there is a main hall, catering kitchen, offices and activity rooms, toilets and storage. Rooms and facilities in the building are used for events and hired out.

When Highlife took a five-year lease of the building in 2021 from Coventry City Council it was in extremely poor condition. It had a leaking roof, areas of damp, dangerous floors, was dark and unwelcoming. The building was difficult and expensive to heat so was frequently cold. No condition survey was prepared when the lease was first granted but Highlife was responsible for maintenance and repairs to the building.

Windows were single glazed. Apart from the cavity walls there was no insulation. The gas boilers, of which there were two, were meant to provide heating and hot water but never worked properly.

Lighting was old style fluorescent tubes.

The building's energy use was not being actively managed.

Water use was for toilets and kitchen.

Externally the building has small outside areas. A freestanding pod café (36m^2 Gross Internal Area) was added at the front of the building c.2023. The Hall is located on a junction, so the site is very constrained.

An EPC certificate was issued in 2021 that provided a rating of 93 D.

Development of the Idea

The condition of the building was turning potential users away. The Youth Investment Fund presented an opportunity to undertake the much-needed improvements to make the building usable.

Young people contributed to the ideas for the building and how they wanted to use the spaces. But they didn't know much about the environmental aspects.

No planning application was required for the works.

The Completed Building

Works to improve the building started in February 2024 and were completed around November 2024.

The improvements to the building included:

- Repairs to the roof and improved insulation
- Installation of PV panels to the roof and battery storage

- Replace gas radiators with electric heaters
- LED lights installed throughout
- Doors and access improvements
- Hair salon installed
- Increased youth space
- Catering kitchen installed
- New kitchen for youth space
- Recording studio
- New toilets
- New floors
- Painting and decorating throughout
- Rewiring
- New security doors
- Intruder and fire alarms
- Better training facilities
- New storage spaces
- Garden improvement including fencing and gates.

Various contractors were appointed to undertake each element of the works.

The Highlife Centre managed the development process themselves. Works were specified by the project manager. However, the project manager had to leave the project after the works had

started. This led to significant delays and a loss of project knowledge. A local architectural designer was then commissioned to respecify the works.

The cost of the works was c.£350,000. This was funded by the Youth Investment Fund with an additional grant from West Midland Combined Authority paying for extra fixtures, fittings and furniture.

Fabric

The walls already had cavity insulation.

A new roof covering was installed by Garland. This includes insulation panels. Additional timberwork was put in place to assist drainage. This was completed in March 2024.

Some windows were installed where previously there were blocked up openings.

Heating, Cooling and Ventilation

Heating is now by thermostatically controlled electric radiators. There are three in the hall which can now get quite warm.

Ventilation is natural. No cooling provided.

Lighting

LED lights have been installed. Passive infrared sensors are installed in some areas.

Renewables

The solar installation of approx. 26 panels has a capacity of 13kW. The Solar Electricity Generating System cost £23,367.67 including four 2.5kW FoxESS batteries. Three additional FoxESS batteries were subsequently purchased at a cost of £3,720 giving an installed capacity of 17.5kWh.

An export account was setup with EDF from October 2025 but as of March 2026 was not recording any power exported. Access to the FoxESS monitoring platform to aid understanding of power import and export was delayed by the departure of the previous project manager. After access to the platform was obtained it transpired that none of the devices were online. The installers were not helpful in resolving these problems, so the charity has been reliant upon support from their energy supplier and third party contractors.

Appliances

Gas is still used for the ovens in the catering kitchen. Fridges in the catering kitchen have been replaced with A rated appliances.

Power

Most of the building has been switched to electricity which is supplied by EDF. One of the gas boilers is in use for the catering kitchen while the other has been decommissioned.

Energy Performance Certificate (EPC)

No EPC has been provided since the works were completed.

An EPC dated 24 January 2024 describes the building as ‘Non-residential Institutions: Community/Day Centre’ and provided a rating of 153 G. This is lower than the existing stock benchmark of 76 D and lower than the previous EPC. This certificate predates the improvements to the building and lists the main heating fuel as gas. This would have contributed to the poor rating. A new rating is being arranged.

Water

Most use is in the catering kitchen and toilets. Toilets are dual flush.

Hot water is provided by the gas boiler.

Maintenance

Management of the building is by the Operations Manager.

Outcomes

Everyone is happier. Before the works the problems with the building limited the extent to which it could be hired. Income from hires was c.£1,500 but now it has risen to c.£5,000.

Highlife's youth programme is a lottery funded project. Previously about 35 young people attended per month but this has now reached an average of 56. This is attributed to the charity being able to provide more activities but also because word-of-mouth means people know the space is now better quality.

Future Plans

- Seek advice to aid understanding how to manage the building's energy use and maximise the efficiency of the renewables.
- Window replacements with double glazed units.
- There is one wall in the main hall with persistent damp that needs to be addressed.
- The main hall flooring needs to be upgraded – the replacement is already lifting.
- Upgrade the power supply to three phase.

Lessons

Get a good project manager! Get involved in the process from the beginning and really understand it. Don't just trust someone else to do the job and leave them to it. If doing the works again the charity would tender for a project manager. As Christabell Amoakoh the CEO says, "It was hard to juggle multiple work strands along with managing this project".

Data

No BRUKL (Building Regulations UK Part L) report has been produced for the building.

The most recent EPC provides:

Building emission rate (kgCO2/m2 per year) 59.33

Primary energy use (kWh/m2 per year) 351

From April 2025 to March 2026 the building imported 12,070kWh of electricity from the grid. This equates to 33kWh/m^2/year.

Gas use in the same period totalled 4,680kWh. As there was no gas use in April 2025 the more realistic gas consumption will be c.5,000kWh/year.

Combined electricity and gas use was 16,750kWh for April 2025 to March 2026. This equates to 46kWh/m^2/year. Note that this does not take account of electricity generated by the solar panels and used by the building.

The figures mask extremely low electricity use in some summer months (frequently less than 1kWh/day) and extremely high use in some winter months (frequently over 60kWh and peaking at 178kWh/day).

Explanations might lie in the move from heating by gas to heating by electricity (accounting for much higher use in winter months) and the solar panels powering the building in the summer (even though there is no export to the grid). Increased use of the building will also account for some increased energy use. Optimisation of the energy tariff and the batteries might help reduce winter use of peak-time grid electricity while data on exported energy to the grid will show a reduced carbon impact.

The Lowdown, Northampton

3 Kingswell Street, Northampton, NN1 1PP
https://thelowdown.info

Summary

Refurb and extension of a listed building providing additional space, improved facilities and a more comfortable environment for young people seeking mental health support.

Key Features:

Solar: None

Heat: Gas boiler powering central heating in existing part with underfloor heating in the extension. Point-of-use heaters for hot water.

Batteries: None

Impact:

Energy improvements have been limited by the listed status and configuration of the building. Nevertheless, the overall improvements to the building have resulted in a much-improved environment for young people and staff alike.

Energy Performance Certificate (EPC)

125 E. This is comparable to the existing stock benchmark of 121 E

The Lowdown Case Study

The Lowdown is the only listed building amongst the case studies. Located in the centre of Northampton it was built in 1862 and originally used as a school for girls. It was listed Grade II in 1952. During the 1980s it was used by a youth organisation and nursery. It has been occupied since 1989 by The Lowdown, a mental health charity that provides free, safe, non-judgemental, and confidential mental health and support services for 8 to 25-year-olds.

As a listed building The Lowdown presents particular challenges when it comes to both occupation and energy management.

Youth Investment Fund Grant: £1,292,064.00

The Building Before

The Lowdown is a street frontage, two storey, Victorian building. The building has a combination of single brick and stone walls with a slate roof. Inside there are multiple small rooms. Many of the older mullioned windows have draughty gaps.

Prior to the works the building was not well maintained. An old gas boiler had reached the end of its serviceable life. The temperature throughout the building was controlled by one thermostat located in a counselling room which itself would often overheat thereby meaning the rest of the building was too cold. Radiators did not have Thermostatic Radiator Valves (TRVs).

Staff describe the building as having been either boiling or freezing with no in-between. Portable radiators were used in many rooms and often left turned on after the occupant had left. This contributed to high energy bills.

Lighting was a mixture of fluorescent strip lights and conventional bayonet fittings with old bulbs. Light replacements would have low energy bulbs.

A smart meter had been installed. Despite bills being high the energy use was not being actively monitored or managed.

The toilets were inadequate including a concertina door on the disabled toilet and no baby changing facilities.

To the rear the building has an enclosed yard surrounded by three to four storey neighbouring buildings.

Various incremental improvements had been made over the years.

- BBC Ground Force improved the yard in 2000

- The Lounge (seminar room) was built in the yard in 2022 as a youth space. This is heated via an air source heat pump.
- The extent of the works was often constrained by the lack of funding.

Prior to the works the main entrance to The Lowdown was through a heavy gothic front door. The waiting area was cramped and dark. Young people considered the building to be old fashioned, dark, cramped and basic. This posed the question of why any young person who was coming to The Lowdown because of their mental health had to come into a dilapidated building. Nevertheless, long term staff held the building with affection due to its humble beginnings and a history of making the best of what they had.

There was no EPC certificate for the building.

The Gross Internal Area (GIA) of the building was 258m^2 and The Lounge added an additional 20m^2.

Development of the Idea

The charity had learned a lot from building The Lounge. Works to the main building were to provide new and improved mental health space for young people. Demand for the charity's services was increasing and had outgrown the available space meaning that other buildings were having to be used.

The Youth Investment Fund grant would enable the buildings size to be increased to accommodate the increase in demand for counselling services and other services to support young people's mental health. The landlord, which is itself a charity, was very supportive of the proposals and mostly gave The Lowdown a freehand with the designs.

A more energy efficient building was needed in order to keep running costs down. An air source heat pump was considered but taken out of the scheme during value engineering when a focus was needed on essential works. Secondary double glazing on the old windows was also included in the plans but in the event only possible on one window.

Young people were involved in discussions about the designs. Their priority was getting mental health support in a supportive environment, so they contributed to choosing the internal decorations to make it feel that it was their space. The drive for environmental improvements came from the management team and as a requirement of the funding but did not come from young people. The Board was very supportive of all the management team's proposals.

A number of planning applications were submitted. An application in 2019 had secured consent for The Lounge and a single storey side extension. An application submitted in September 2022

(ref WNN/2022/1031) increased the side extension to two storeys in order to accommodate increased demand for the charity's services. Permission was granted in May 2023. Variation applications were submitted and approved in 2023 and 2024. The applications can be found on West Northamptonshire Council's Planning Portal.

During the works the management team and some of the youth provision had to move to leased temporary premises.

The Completed Building

The works were designed by BRP Architects of Market Harborough. QS and project management provided by RJA Consultants (now Gateley RJA). An M&E engineer designed the heating and electrical system and contributed to discussions regarding the air source heat pump. Probus Construction were contracted for the full works package.

The project had to wait eight months for planning permission to be granted (the Grade II listing of the building meant design changes had to be made to materials and positioning of the extension) so the whole development process took about 2 years. Works were also delayed for around four months when drain problems were encountered.

Construction works took 12 months through 2024.

The completed works include:

- A new wrap-around extension providing on the ground floor a consultation room, office space, waiting area and dedicated entrance for all young people to use, and on the first floor four counselling rooms, storage and toilet.
- Improved accessibility. An access report was commissioned resulting in removal of any lips on downstairs floors, widened doors and widened corridors. There is a platform lift at the front door but a lift to the first floor was going to cost £100k and take up valuable space.
- Improved toilets with more circulation space outside them making them feel more discreet – a major need for young people.
- Reconfiguration of other rooms all of which are now to the same standard for any young person accessing services.

The GIA of the building (including The Lounge) is now 358m^2, an overall increase of 26%.

The construction cost was £919,000 including fees, contingencies and VAT. The cost was almost entirely funded by the Youth Investment Fund. The landlord contributed c.£25k for additional works.

Fabric

The extension has a traditional build of brick and block and a single ply flat roof.

The main building has been insulated wherever possible, but the fundamental fabric of the building could not be changed due to the listing. The loft has been insulated as much as possible but there is no floor insulation in the main building.

All guttering was replaced to ensure it operates correctly (there had previously been some flooding).

Maintenance was carried out to pointing and windows were repainted while the building was scaffolded.

Secondary glazing for one window was installed but the others will wait until the future.

Heating, Cooling and Ventilation

Instead of an air source heat pump, a new gas boiler was fitted (Ideal Logic Plus System2 S30 with 30kW output).

The extension has underfloor heating served by the gas boiler. All rooms in the extension have thermostatic controls and there is a master Heatmiser control panel in the ground floor corridor which is programmed to heat the spaces at various times of the day.

Radiators in the rest of the building have been fitted with TRVs. There are still some portable radiators in the building to meet specific individual needs, but their use is controlled and much reduced compared to the past.

Ventilation is natural throughout the building and the extension.

Other mechanical and electrical systems were upgraded throughout the building including a new fire alarm and access control system.

Lighting

Lighting was completely overhauled to meet current standards with LEDs fitted.

There are some passive infrared sensors in the toilets, but it was not appropriate in all areas.

Renewables

Solar panels were considered for the previously proposed single storey extension but were not specified due to shading from neighbouring buildings. Now that the extension is two storeys the impact of shading is reduced so solar panels may be an option for the future.

Appliances

Dishwashers in each of the three kitchens are C rated. Fridge freezer on ground floor. Electric cooker in The Lounge.

Power

Electricity and gas are supplied by E.ON.

Energy Performance Certificate (EPC)

The EPC describes the building as ‘Offices and Workshop Businesses’ and provides a rating of 125 E. This is comparable to the existing stock benchmark of 121 E.

The charity hoped for a much better rating but recognise that the structure of the building is a significant constraint given realistic budgets.

Water

A water butt has been installed in the yard for watering the planters.

The building does not have a hot water tank. Instead Quooker taps have been installed in the kitchens for cold, hot and boiling water. These are very space efficient but do require maintenance.

In the toilets the taps are time limited and at an ambient temperature. There is a point of use heater for each tap.

Maintenance

With the increase in the number of service contracts the building's costs have risen, but the building is better functioning.

A new bin storage area next to the extension has taken large bins off the street. All waste is separated.

Outcomes

With a relatively small extension all services are now provided from one building and are meeting the demand from young people.

- There has been a huge overall improvement to the building. "The design was right, the space is versatile and we get a lot out of it. It has delivered what we needed" says CEO Sharon Womersley.
- Happy with energy as of now but still need further improvements.
- The waiting area is much nicer.
- Having generous storage space means that everything in the store can be readily seen which avoids duplicated purchases.
- More young people now come for support. Previously about 400 people used services at the building. Now 6-700 young people per month access services at the building. Part of the growth has been achieved by bringing other services into the building but it is still higher than anticipated. The Youth Investment Fund revenue funding enabled new services to be tested and brought online.

Future Plans

Secondary double glazing on the older windows for which the charity is talking to a funder.

Temperatures in some older rooms are still unbearable in high summer, so they are considering an awning to provide shade. This would be preferable to running lots of fans.

Installing a pergola in the garden to increase youth space further.

Possible solar panels on the extension roof.

Lessons

- The main contractor was not local and was selected because they were within budget while local contractors could not get close on price. With hindsight it might have been

worth bringing the scope of works down in order to use a local builder simply because of the knock-on effect of trying to sort out problems after completion of the contract. Someone local who is responsive and can easily come out and address issues would have been invaluable.

- Go and look at a prospective contractor's other projects. Pay close attention to the quality of the work (e.g. finishes, details, durability etc).
- Consider the implication of the contract not being finished to schedule and make contingency plans. Factor in the impact on your work and the services you deliver.
- Be clear where responsibility lies if fittings don't work properly – is it the contractor or the installer?
- New equipment and installations connect to the internet and now, with increased use of the building as well, the internet bandwidth is not sufficient. Increasing the bandwidth is proving difficult not least because it requires attachments to the building which in turn require listed building consent.
- It was an exhausting process – demanding physical and mental energy and time.
- Before the build started the water supply company noticed that water was running 24/7. It transpired that there was a major water leak for which the charity had been paying. It took a long time to identify the cause and to then resolve it, but a refund was eventually paid. Points to the need for benchmarking and monitoring of utility use.

Data

As the building is listed and works were refurbishment no BRUKL (Building Regulations UK Part L) report was produced.

EPC data:

Building emission rate (kgCO2/m2 per year) 47.98
Primary energy use (kWh/m2 per year) 288

Sample gas and electricity use for Nov-Dec in 2023 and 2025 was provided:

	Gas + elec kWh	M^2 GIA	kWh/m2/month
Nov 2023	4054.4	258	15.7
Dec 2023	4274.7	258	16.5
Nov 2025	4961.6	358	13.8
Dec 2025	5362.8	358	15.0

While gas and electricity use has risen the size of the building also increased by 25%. Looking at the energy use per square meter in the given winter months there is a reduction from c.16kWh/m2/month to c.14.5kWh/m2/month. Energy use in the summer months will be lower.

The New Lodge, SYA (Shrewsbury)

The New Lodge, Upton Lane, Monkmoor, Shrewsbury, SY2 5RR

www.sya.org.uk

Summary

New build youth facility and offices that near Passivhaus[2] standards and outperform the energy use predicted in the Energy Performance Certificate.

Key Features:

Solar: 18 solar panels with a capacity of 18.65kWp

Heat: Air source heat pump and heat recovery ventilation unit

Batteries: Three batteries providing 18kWh

Impact:

Compared to the previous building, electricity use has been reduced by two-thirds and water use has potentially been halved. Staff and young people are much happier in the new building and there is lots of demand from local organisations to hire the rooms and facilities.

Energy Performance Certificate (EPC)

10 A which is slightly better than the benchmark of 11 A.

The New Lodge Case Study

SYA (previously Shropshire Youth Association) is a CIO formed in 2017 which provides youth services throughout Shropshire.

SYA was awarded a Youth Investment Fund grant of £1,946,171.00 (Capital and revenue) for a new build construction.

[2] Passivhaus, literally passive house in English, refers to buildings created to rigorous energy efficient design standards so that they maintain an almost constant temperature. Passivhaus buildings are so well constructed, insulated and ventilated that they retain heat from the sun and the activities of their occupants. This means they need minimal extra heating or cooling.

The Building Before

SYA's previous building was on the same site. It was a ten-bay modular timber clad unit measuring 256sqm that had previously been used at a school. It was brought to the site in 2008 for use as a youth club run by Shropshire Youth Service and then later occupied by SYA.

The building comprised one principal activity room with several smaller meeting/activity rooms, a reception area, toilets and stores.

Heating was provided by night storage convector heaters supplemented by electric blow heaters. Hot water was provided by three instantaneous electric water heaters which weren't always sufficient to meet demand, especially after cookery sessions. Fluorescent lights were fitted throughout. The building did not have an EPC rating.

While the building had once been considered to meet high standards of energy efficiency by the time of its demolition, many of the double-glazing units had blown, plus visible gaps around doors and windows made the building draughty. It was frequently leaking and generally in need of repair. It became very hot in the summer and spatially offered little opportunity to expand the youth work programme.

But despite the condition of the building, the staff achieved a high quality of provision and young people enjoyed accessing their services.

Development of the Idea

Recognising the shortcomings with the existing building, SYA wanted to provide a first-class youth centre for young people together with a headquarters for the charity to enable it to offer a professional youth service across Shropshire. The building would need to have low maintenance requirements and be as environmentally friendly as possible.

A cardboard model of a proposed building was made as a way of engaging young people in discussions about the design of the building and how it would be used. Staff also contributed to the designs, drawing on their knowledge of the previous building and how it did and didn't work. Board members were supportive of the environmental approach.

Young people were aware of the environmental aspects of the building, some more than others. Ultimately most of them understood the need to avoid unnecessary costs and that an environmental building would be cheaper to run. Young people were also engaged in putting up bird boxes.

A planning application was submitted in March 2023 with permission granted in March 2024. The application can be found on Shropshire Council's Planning Portal reference 23/01256/FUL

The Completed Building

Construction started in early November 2023 and was completed in late June 2024. SYA had relocated their offices to temporary premises provided in one of the local council's buildings. This was hard for everyone with poor quality space that couldn't accommodate the whole team at the same time. Youth provision moved to the Scout hut opposite which was adequate but not ideal.

The finished building measures 327sqm Gross Internal Area (GIA) and cost £1.5M to develop which was fully funded by the Youth Investment Fund.

Design and project management was provided by Property Services Group at Shropshire Council. R1 Construction was the contractor. Mechanical and electrical services were provided by Penguin MEP.

The New Lodge provides:

- Ground Floor (193sqm GIA): Large space for youth provision with a breakout area and creative space, open plan kitchen, training room, unisex toilet cubicles, cleaner room, lobby with lift and stairs to first floor.
- First Floor (134sqm GIA): SYA open-plan office, manager's office, toilets, kitchen.

- Externally there is a six-space car park, freestanding equipment store, outdoor gym, electric vehicle charger and boundary landscaping.
- Upstairs the open plan office is described by the staff as incomparable to their previous offices. The space facilitates collaboration and communication within the team and helps their understanding of what others are doing.
- They have private breakout spaces to avoid disturbing other people, while the downstairs training room is also wired up for Teams meetings.

Fabric

The building was constructed with a concrete floor and SIPS (Structurally Insulated Panels). Windows are triple glazed.

Heating, Cooling and Ventilation

Heating, cooling and ventilation is provided by a Daikin VRV5R32 heat pump and heat recovery ventilation unit. The specification had to be upgraded when it was discovered that the unit previously specified used a redundant, and more polluting, refrigerant gas. This would have ultimately limited the serviceable life of the unit. The upgrade added £4,500 to the budget but provided futureproofing. Ceiling cassettes provide fresh warmed or cooled air to each room. There are electric radiators in smaller rooms.

Brise soleil[3] have been installed on south facing windows to give summer shade.

Thermostats can be set centrally (via app if needs be) or adjusted in each room. They reset daily to a default setting.

In the air permeability test the building achieved 0.7m3(h.m2)@50Pa. The Passivhaus standard is 0.6m3(h.m2)@50Pa

Lighting

LED lighting throughout the building with passive infrared sensors presence detection to switch off automatically if there's no movement.

External lighting is on a time switch.

Renewables

The building is fitted with 18 Suntech Ultra V Pro solar panels on the south-east face of the roof. The total generating power is 7.65kWp.

Electricity battery storage is provided by FoxESS EQ4800-S with three batteries totalling 18kWh. The initial installation had one battery(s) but this was increased to three in 2025.

There is one Deta E eVoomXT 22kW public EV charger installed at the entrance in a parking bay outside the perimeter fence. A contract with clenergy-ev.com manages public use and payments.

Appliances

All appliances in the kitchen are A-rated.

Energy Management

Penguin MEP setup the energy management system and have a two-year management contract. The system is set up to charge the batteries during the cheap periods. The heating is scheduled to come on before the cheap tariff ends so that the building is heated to temperature, after which the batteries take over again and provide energy throughout the day. Other than adjusting room temperatures, the staff in the building do not actively monitor energy use or generation in part because the meters are not user-friendly.

[3] Brise- soleil translates as sun breakers – a devise that reduces a building's heat gain by deflecting incoming sunlight.

Power Supply

SYA was previously with West Mercia (a supplier to local authorities) but switched to E.ON in March 2025. They would have liked a green tariff, but this would have been more expensive.

Energy Performance Certificate (EPC)

The building has achieved an EPC rating 10 A. The EPC classifies the building as 'Non-residential Institutions: Community/Day Centre' for which the new build benchmark is 11 A, so the standard has been exceeded.

Water

A single boiler supplies water for the downstairs toilet handbasins and the cleaner's sink. Elsewhere there are under-sink point of use heaters in the craft room and the downstairs kitchen. A single point of use heater in the upstairs kitchen also supplies the upstairs toilets.

Soakaways absorb surface runoff from the building and the hard surface areas. Foul drainage from the building connects to the public sewers.

Maintenance

The amount of equipment in the new building means that maintenance obligations are extensive. SYA has endeavoured to setup maintenance contracts for everything in order to avoid an ongoing administrative burden. It is anticipated that maintenance costs will be higher than the previous building.

Outcomes

- The benefits of working together in the same space (as opposed to remotely and or at different times).
- Lots of demand from local organisations to hire rooms and facilities; they usually have a direct or indirect link to young people.
- The team can cook more than before the new build. The kitchen is well used by parent and toddler groups, for example having lunch together.
- The quality of the offer is now much better than before.
- The outdoor space is safe and usable throughout the year, from 8am onwards.

Future Plans

SYA has no further plans for the building and is now focusing on improving and extending provision for which the building provides an excellent launch pad.

Lessons

- Give yourself plenty of time to identify what you really want before you proceed to any sort of design or ideas about what's actually going to be on the ground.
- Do your research. Sometimes a contractor will give pro-bono support on designs in the hope of, but without any guarantee of, getting the construction contract.
- The project manager is essential, they've got to be good, so be careful who you choose.
- Make sure you've got somewhere to move to while building works are ongoing and include the costs in your budget. You have to be able to deliver your services from that temporary space.

Data

The table below summarises the BRUKL[4] report. The middle column shows the figure that the building should be achieving. For energy consumption and emissions this is theoretical calculation for a 'notional' building of the same size, shape, orientation and shading as the actual building, with the same activities, zoning and system types and exposed to the same weather data. The column on the right shows the calculated figure for the New Lodge itself.

Performance u value (W/m^2K)	**Acceptable limit**	**The New Lodge**
Walls	0.26	0.14
Floors	0.18	0.1
Pitched roofs	0.16	0.12
Windows	1.6	1.2
Doors	1.6	1.2
Air permeability	**Standard**	**The New Lodge**
$M^3/(h.m^2)$ at 50Pa	8	1
Energy Consumption (kWh/m^2)	**Standard (notional)**	**The New Lodge**
Heating	16.26	5.51
Cooling	2.16	3.32
Auxiliary *	2.37	5.7
Lighting	6.73	9.53
Hot water	11.94	13.76
Total	39.46	37.83
Energy & Emissions	**Standard (notional)**	**The New Lodge**
Heating & cooling (MJ/m^2)	164.23	131.78
Primary energy (kWh/m^2)	46.87	46.81
Total CO2 emissions (kg/m^2)	4.51	4.39

[4] BRUKL - Building Regulations UK Part L

* Controls, pumps and fans throughout the building

The figures in the table for primary energy use and emissions are reflected in the EPC.

Electricity Use

In the year 2025, the imported electricity consumption of the new building was 13,671kWh. With 320m^2 GIA, this equates to 43kWh/m^2. Over a year it equates to 36.5kWh/day (although daily use will vary considerably).

In the nine months Sept 2022 to August 2023 (i.e. during occupation of the previous building) imported electricity consumption totalled 27,493kWh. With a floor area of 256m^2 this is a power usage of 107kWh/m^2.

For 15 months from July 2024 to September 2025, the solar panels exported 3,051kWh to the grid. For this SYA received payments totalling £600.

The import and export figures are not entirely coterminous (export figures will be lower for a 12-calendar month period), so after energy export to the grid is taken into account the net energy use from the grid is likely to be approximately 11,000kWh. This reduces the imported energy use per square meter to approximately 34kWh/m^2.

Water Use

Data regarding the volume of water used was not available, but payment records indicate that the new building uses approximately half the water of the old building.

Author's Conclusion and Recommendations

Conclusion

Key points from the study:

- While some case studies were carefully monitoring their energy use, others had little knowledge of their consumption or even where to find the information.

- Strong project management is essential and was the key factor for the most successful cases.

- The fact that new builds out-perform refurbs is well established, but in some cases, more could have been achieved by the refurbs had there been greater encouragement and guidance. This is especially the case given the limited technical knowledge and capacity of many grantees.

- Listed buildings present particular challenges that are expensive and time consuming to overcome.

- For many buildings, especially those reaching Net Zero, maintenance and eventual replacement of complex and expensive equipment will need to be factored into long-term budgeting.

- Just funding the installation of renewables does not guarantee the installation will make a difference to a building's energy use. Installers sometimes fail to complete the process or provide inadequate instructions to the grantee. In other cases, the grantee does not have the skills and or engagement to monitor the installation to ensure it is delivering the best value.

- Opportunities to further improve some buildings were missed, e.g. installing a heat pump in preference to electric radiators.

- 105th Sheffield (High Green) Scouts was the stand-out example of how to achieve the net zero target and reflects the determination, knowledge and professional experience of the project leader. While an outlier, it does provide a standard to which other projects can aspire.

- The Cowshed had the most eco-conscious approach, led by an acute awareness of the benefits of nature and how it can help meet the needs of young people. The project's ambitions for the building's environmental performance were very high but some opportunities to reduce energy use were missed due to confusion with specifications, failed

commissioning and limited technical knowledge. In these aspects other projects are much stronger. This is not a matter of fault or blame but does point to a need for project leaders to ensure that the resulting project and its ongoing management combines both the energy that we measure in kilowatts with the energy to improve young people's lives.

Recommendations

- Greater scrutiny of projects at the development stage to assess their energy proposals and, where appropriate, encourage them to increase their energy efficiency.

- Greater scrutiny of contracts and support that installers will provide to grantees to ensure that they are not left with partially completed installations and or commissioning.

- Potentially, programme level collaboration with a national renewables installer to provide a higher quality of service and longer-term support.

- Requirement for grantees to reach a defined skill level in energy management including monitoring energy use and contribution of renewables to the energy mix.

- A greater focus on reaching and surpassing BRUKL (Building Regulations UK Part L) and EPC (Energy Performance Certificates).

- While many Youth Investment Fund projects included elements of sustainability, for others it was too challenging, confusing or potentially expensive for inclusion at the application stage. The interim evaluation report (Ipsos, October 2024) states *"Applicants were not sure about the weight given to the environmental sustainability of investments in the assessment process and were keen for the costs of their projects to appear reasonable. Clarifying how environmental sustainability would be assessed would have given applicants greater certainty about whether and how to integrate sustainable capital features into their projects."*

- As a lesson learned the evaluation states *"Future fund guidance could include examples of environmentally sustainable features, the costs, and projected longer term financial and environmental benefits, alongside how energy efficiency would be assessed during the application process. Environmental sustainability could be considered a fund assessment pillar for future funds that have this aim to signal its importance to potential applicants."*