Update for PCC meeting on 8th September 2025 on the Project Team's Current Thoughts

We wanted to update you on the progress we've made, and to share how various insights have helped shape and advance our project. We've made several adjustments that we believe bring us closer to achieving our overall goal.

Upgrading To Three Phase

National Grid visited the church on 23rd July 2025 and provided an initial cost estimate of around £12,000. A significant portion of this relates to civil works for trenching (300mm wide by 600mm deep), which we may be able to source locally at better value. National Grid will supply the required specifications and are happy for us to undertake the trenching, subject to their prior approval. If we retain the current fuse board location, internal trenching and floor excavation will be needed, along with a 40mm access hole through the wall. Due to limited power availability on our side of the street, connecting from the opposite side may be necessary - adding substantial cost and requiring a road closure.

Upon receiving their budget estimate, we were advised that the quote exceeded £20,000 - excluding any additional costs associated with a potential road closure required to connect to the opposite side of the street and the additional costs associated. While we're not ruling out the possibility of a three-phase supply in the future, it's unlikely to be incorporated into the scope of our current project.

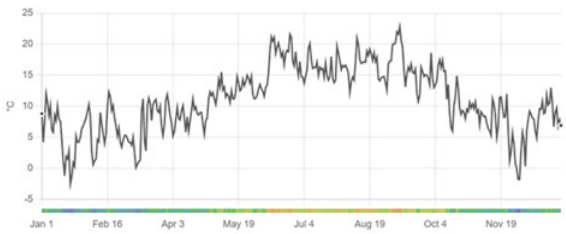
Solar PV

We have decided to defer consideration of Solar PV until we have established what the total plan is for our heating.

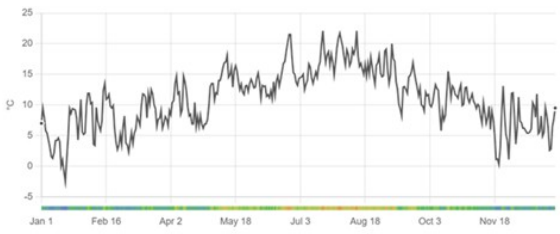
Space Heating

Over the past few months, this area has been a central focus of our work. Feedback from a meeting with Colin Angus, Net Zero Carbon Project Officer, prompted us to reassess our approach with fresh eyes. In hindsight, we may have been somewhat optimistic in aiming for a solution that could meet every possible need. Our goal was to modernise the wet heating system to deliver smooth, consistent, and dependable space heating - particularly during full-building use or colder periods - but his insights helped us better understand the practicalities and refine our expectations.

We looked at the average daily temperatures for CV10 0LY for 2023 and 2024 – see graphs below.



2023



2024

Based on the data presented in these graphs, it appears that space heating may only be required for approximately five weeks each year. When factoring in additional non-standard services, the system would likely be called upon for around ten services annually.

Following a simple cost-benefit analysis, we determined that for the relatively few occasions - approximately ten services a year - when full-building heating is required, the proposed upgrade to our current system, including replacing the aging gas boiler with an electric alternative and installing new radiators, offered limited value. Instead, we found greater merit in exploring targeted solutions that focus on heating people rather than the entire space.

By taking this approach, it removed the immediate need to upgrade to a three-phase supply - provided we can maintain adequate control over energy usage within the building using our existing 240 volt, 100 amp supply. We will now ask an electrical engineer to audit our plans.

Convection Heating

Our original plan was to use convection heaters to gently warm the space prior to each service, supported by underpew heating to enhance seated comfort. However, given the building's considerable size (13.5m × 30m × 7.5m), it quickly became apparent that convection heating would be both inefficient and energy intensive. In a space of this height, warm air naturally rises above the occupied zone, meaning that even after extended operation, the heat fails to reach the congregation in any meaningful way.

Theoretical modelling suggests that in a perfectly sealed and well-insulated Winter Zone (13.5m × 12m × 7.5m) with four 2kW convection heaters, it would take a minimum of 31 minutes to raise the temperature. – which is close to the 40 minutes that the Dyson Technical Department quoted during our initial correspondence.

However, this ideal scenario doesn't reflect reality. In practice, several factors significantly extend heating time:

- Heat loss through walls, windows, and roof
- Poor insulation, typical of historic church buildings
- Air stratification, with warm air pooling near the ceiling
- Heat absorption by furniture and building materials

Given these conditions, we now estimate that it would take between 2 to 4 hours - or more - to raise the temperature by 10°C. For short-duration use, the impact of convection heating is likely to be negligible. With no insulation and unavoidable heat loss, preheating the space using convection units results in high energy consumption with minimal perceptible benefit – and again their use could only be 10 times during the year.

Winter Zone

The initial plan was to combine convection heating with theatre curtains to contain the heat within a specific area.

If we move forward with using only underpew heaters and/or heated stadium-style seating during services, we need to consider whether the curtain option remains necessary or effective. With warmth now being delivered directly to seated individuals, the role of curtains in retaining ambient heat may be significantly reduced, potentially making them redundant in this revised approach.

However, since we currently see no need for convection heating, the requirement for theatre curtains has also been set aside. However, we acknowledge that future circumstances may prove otherwise.

With that in mind, our plans have been designed to accommodate the potential inclusion of these elements at a later stage - particularly by ensuring appropriate provision for electrical sockets and infrastructure should they be needed.

Combined Underpew and Personal Heated Pads

We assessed electrical usage within the building and have divided the areas into several areas.

- **Always On**: These are items that will always need to be available. These include; heating control panel, router for internet, photocopier, Internal lights, external lights, altar lights, vestry lights, library lights, heaters & computers. These add up to a maximum of **4.93kW.**

- '**School Room'** (the new room with external access): This includes the combined heating and light units plus additional items, with a maximum of **1.84kW.** Unlikely to be used during a service.

- '**Church Room'** (the other room which could be used for Sunday School and Prayer Group): This includes the combined heating and light units plus additional items, with a maximum of **1.84kW**

- **Other**: This would include the stadium heater charging area and items for the heritage zone, with a maximum of **2.8kW.** Unlikely to be used during a service.

Our calculations indicate that we have approximately 16kW of capacity available before reaching the limit of our existing single-phase electrical supply.

We've revised the specification for the underpew heaters and are now planning to install BN Thermic's PH30 model, which measures 525mm in width and has a power requirement of 0.3kW per unit. Based on our available capacity of approximately 16kW from the existing single-phase supply, this would allow for the installation of ~40 units.

This revised approach offers greater flexibility. We've assumed that one underpew heater will be sufficient for each side pew, while larger pews will require two units. Importantly, this means we can avoid relocating any pews at the front of the church, should that prove preferable, as the majority will now be equipped with heating. We also plan to leave some areas intentionally unheated, recognising that some individuals may prefer a cooler space.

We also plan to offer personal heated pads as an optional comfort measure for those who may require additional warmth.

Most individuals entering the church arrive in a naturally "warm state," having retained body heat from prior activity or external conditions. However, when the ambient temperature falls below 20°C, the body begins to lose heat. The goal of our project is to maintain the temperature in each person's immediate vicinity as close to 20°C as possible. By achieving this, we can ensure that attendees remain comfortable throughout their time in the space, without the need to heat the entire building volume unnecessarily.

We believe that a layered approach - combining carpet underfoot, underpew heating for the backs of the legs, and optional personal heated pads for top of the legs, bottom and the

lower back - offers the most effective and considerate heating solution for our congregation. This strategy prioritises comfort while remaining energy-efficient and adaptable, making it our preferred option for services held within the church.

Control of Heating System

We're currently exploring various methods to manage our heating system with the dual aim of maximising energy efficiency and preventing electrical overload. In the coming weeks, we'll be meeting with a company that offers a conventional solution. At the same time, we're investigating the potential of integrating Google Home into our setup, which would offer the added benefit of remote access and control. Our intention is to install smart sockets - rather than plug-in alternatives - and configure them into clearly defined zones within Google Home, allowing for more precise and flexible management of heating across the building.

Funding

Since our last update, we've had a very positive meeting with Andy Duncan, Diocese Fundraising Officer, whose support and guidance are proving instrumental in shaping our strategy as we pursue additional funding for the wider project. His insights have helped us gain a clearer understanding of the individual cost components involved, allowing for more focused planning. We're now working closely with Andy and his funding spreadsheet, which we hope will help identify potential funders for most of the work we're undertaking. Further meetings with him are planned over the coming months to continue refining our approach.

Summary

The changes to our initial plans we are proposing are;

- No requirement for three-phase supply
- No requirement for convection heaters
- No requirement for theatre curtains
- No requirement to move pews to the front of church
- Purchasing 20 additional underpew heaters and personal heated pads
- Removal of the wet system for space heating
- No replacement of the wet system for space heating
- Removal of gas meter, and capping off of associated pipework

We will be making provision for additional sockets to be installed at this stage – just in case we need to add additional heating units at a future date.

Although not a primary consideration, as we continue to explore the building's history, we've gained a deeper appreciation for the vision and influence of N.F. Cachemaille-Day, particularly in the transformative changes made to the church during the 1940s.

By removing the need for the items listed above, we're able to preserve the architectural integrity of the space. The visual impact of our proposed changes remains minimal, allowing the character and design legacy of the building to remain at the forefront.

However… Things to be considered

1. If we adopt an approach that relies solely on underpew heaters and/or personal heated pads during services, we must acknowledge that the overall ambient temperature of the church may feel cooler - particularly when people are moving around. However, the seating areas themselves will offer a warm and comfortable experience, precisely where it matters most. This strategy prioritises direct personal comfort while significantly reducing energy consumption and avoiding the inefficiencies of trying to heat a vast, high-ceilinged space. It's a practical and thoughtful solution that balances the realities of our building with the needs of our congregation.

2. If we transition to using only underpew heaters and/or personal heated pads during services, we need to consider the implications for larger gatherings such as Christingle, Remembrance Sunday, large weddings and funerals. These events typically draw a full congregation, with attendees occupying not just the main seating area but also the rear of the church. Since underpew heating provides targeted warmth to seated individuals, areas without designated seating - particularly at the back - may feel noticeably cooler. This raises the question of whether supplementary heating or alternative arrangements will be needed to ensure comfort for those standing or seated in overflow areas during major services.

3. If we remove convection heating from our overall strategy, we need to carefully consider the impact this will have on the Heritage Zone during the winter months, particularly as this area will no longer benefit from any form of direct heating. Without convection heat to raise the ambient temperature, the Heritage Zone may become noticeably colder, potentially affecting its usability for visitors, volunteers, or any planned activities. While underpew and/or seat-based heating will provide comfort in the main worship areas, the absence of background warmth in the Heritage Zone could limit its appeal and accessibility during colder periods. This shift calls for a reassessment of how the space is used seasonally and whether alternative low-level heating or conservation measures might be needed to maintain its function and protect the building fabric.