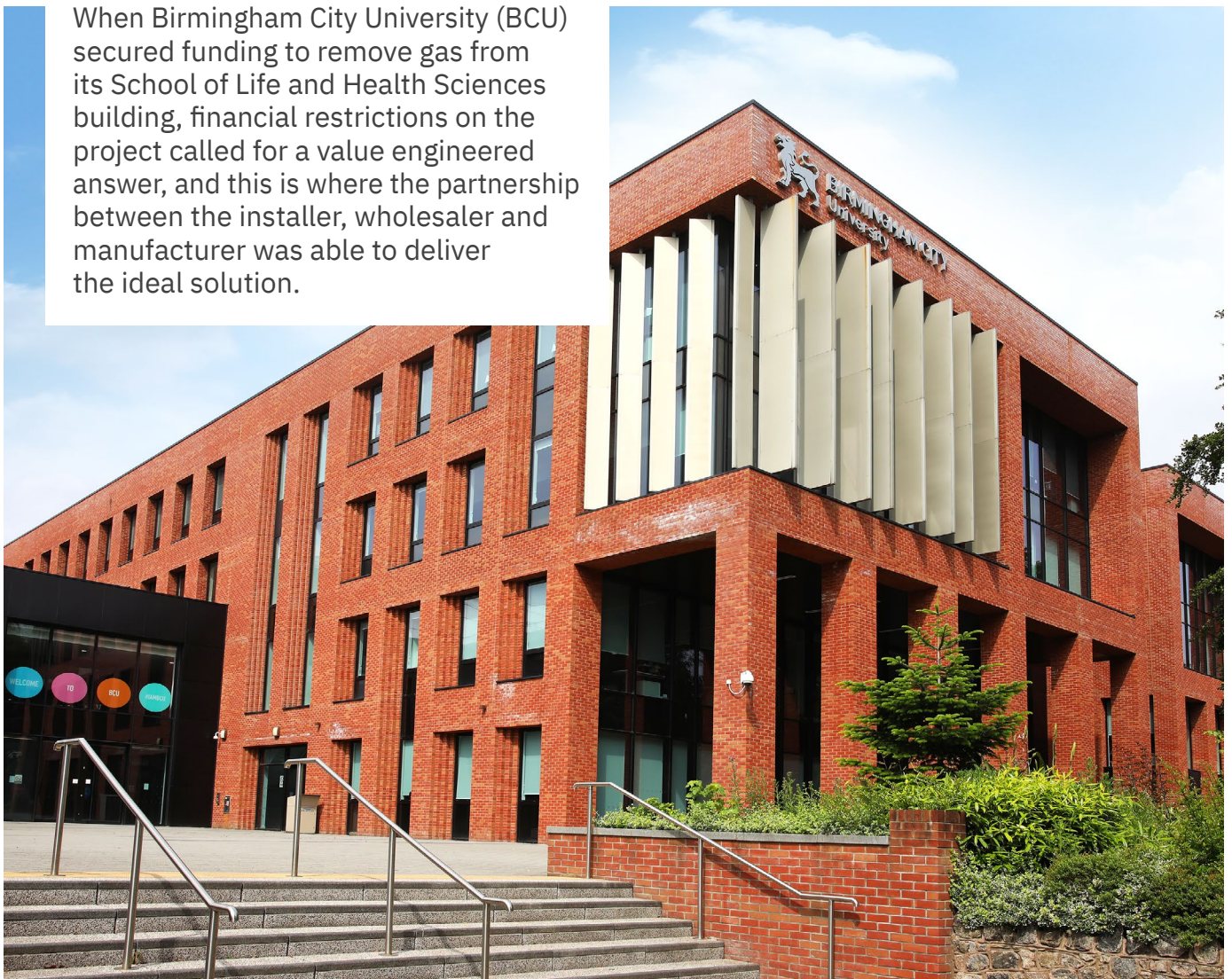


Case Study

Collaboration helps Birmingham City University decarbonise

When Birmingham City University (BCU) secured funding to remove gas from its School of Life and Health Sciences building, financial restrictions on the project called for a value engineered answer, and this is where the partnership between the installer, wholesaler and manufacturer was able to deliver the ideal solution.



The scheme is one of the university's first large-scale, heat pump-led decarbonisation projects and sets a clear benchmark for sustainable building transformation in the higher education sector.



“The university has a strategic goal of working towards zero carbon and we started off by going to Salix for some funding towards some of our decarbonisation,” explained David Phillips, Senior Mechanical Engineer at Birmingham City University.

“We were focusing on the School of Life and Health Sciences as part of the university's decarbonisation journey and SHEco, Kooltech and Mitsubishi Electric had to work very quickly to come up with a solution that was suitable and within budget.”

Salix managed budget allocation from the Public Sector Decarbonisation Scheme and this funding has allowed BCU to replace old chillers and old gas boilers, ticking all the right boxes for the university's carbon reduction programme.

“As principal contractor for the project, we undertook a two-month value engineering process, where we worked with Kooltech and Mitsubishi Electric to support product selection,” added Adam Clark, Commercial Director for SHEco Group, who provide specialist engineering services across the HVAC and renewable sectors.



SHEco and Kooltech collaborated to review plant selections, system architecture, and installation methodology to protect the university's core performance targets while keeping the project within the constraints of the funding.

This process involved re-evaluating heat pump configurations, hydraulic arrangements, and ancillary equipment to reduce capital costs and installation complexity, while maintaining capacity, seasonal efficiency, and operational resilience.

Working with specialist product support from Mitsubishi Electric, flow temperatures and cooling and heating loads for the building were calculated and the right equipment chosen to ensure that the final selection aligned with both Public Sector Decarbonisation Scheme carbon objectives and the constraints of the existing City South Campus buildings infrastructure. Throughout this process, the team identified opportunities such as rationalising plant quantities, and optimising flow temperatures.

"The solution uses two Climaveneta four-pipe simultaneous heating and cooling air source heat pumps", explained Paul Mitchell, Influence Sales Manager at Kooltech.

"These heat water up to 45°C to serve a bank of 'first stage' thermal stores, as well as delivering cooling at 13°C and 6°C."

These thermal stores then pre-heat four EW-HT water source heat pumps which then boost the temperature up to 70°C to go onto the existing secondary system at the University.

"Because we're using the water-to-water heat pumps to boost the temperature to 70°C, we avoided having to change any of the secondary side emitters, which helped deliver the project within budget", added Nick Smith, Business Development Manager for SHEco.

Thin wall stainless steel pipework was utilised to enable on and off site fabrication works, while also reducing weight which was a limiting factor with locating all equipment at roof level.



SHEco's engineering team completed the fit out of the packaged rooftop plantroom which housed the new water-to-water heat pumps, and new circulation pumps to both the primary and secondary circuits. A new control system was also installed and integrated into the existing BMS.

The new equipment now delivers over a megawatt of heating and a megawatt of cooling, so it was vital that the solution used the right products all designed and commissioned specifically for this application.

In addition to the advanced, energy-efficient heat pump systems, the £3.3 million project incorporates a 50kW solar array with 117 photovoltaic panels to significantly reduce electricity consumption. Extensive LED lighting upgrade works were also completed under separate contract. Together, these measures support BCU's long-term sustainability strategy and carbon reduction commitments.

Working together, SHEco Renewable Systems and Kooltech, the UK's leading distributor of Mitsubishi Electric HVAC systems, delivered a value-engineered solution that reduced project costs by £2 million from the original tender, without compromising technical quality or overall performance.

This project stands as a strong example of how collaborative engineering and integrated design can help the higher education sector transition towards low-carbon operation and long-term energy efficiency.

Through innovative in-house design and value engineering, SHEco and its partners were able to help BCU progress its net zero ambitions with a future-focused, highly efficient system that will deliver lasting environmental and commercial benefits.

"We're really pleased with the result," added David Phillips. "The best thing I can say is that we've hardly had to speak to them during the project as they've just carried on and provided us with solutions to any minor deviations that they've come across."



Installation Summary

Outdoor / Indoor Units:

- 2 x Climaveneta NX2-Q-G06/SL simultaneous heating and cooling air-source heat pumps
- 4 x Climaveneta EW-HT water-to-water heat pumps



NX2-Q-G06/SL



EW-HT



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Note: The fuse rating is for guidance only and please refer to the relevant databook for detailed specification. It is the responsibility of a qualified electrician/electrical engineer to select the correct cable size and fuse rating based on current regulation and site specific conditions. Mitsubishi Electric's air conditioning equipment and heat pump systems contain a fluorinated greenhouse gas, R410A (GWP:2088), R32 (GWP:675), R407C (GWP:1774), R134a (GWP:1430), R513A (GWP:631), R454B (GWP:466), R515B (GWP:292), R454C (GWP:148), R1234ze (GWP:7) or R1234yf (GWP:4). *These GWP values are based on Regulation (EU) No 517/2014 from IPCC 4th edition. Mitsubishi Electric's air conditioning equipment and heat pump systems contain a hydrocarbon, R290 (GWP:0.02). *These GWP values are based on IPCC 6th edition.

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