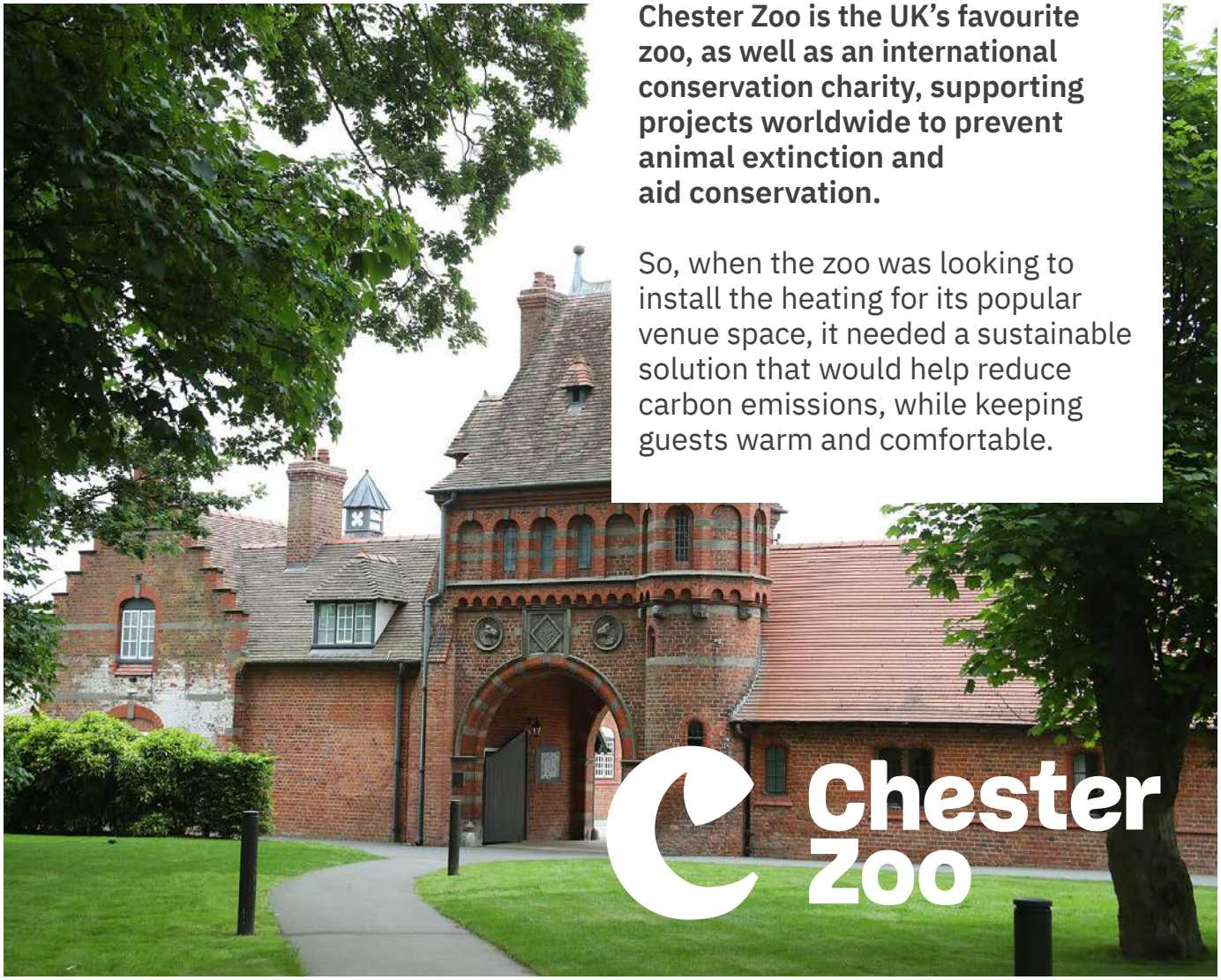
MITSUBISHI ELECTRIC

Case Study

A sustainable space in the heart of the zoo



Chester Zoo is the UK's favourite zoo, as well as an international conservation charity, supporting projects worldwide to prevent animal extinction and aid conservation.

So, when the zoo was looking to install the heating for its popular venue space, it needed a sustainable solution that would help reduce carbon emissions, while keeping guests warm and comfortable.

Case Study

The Square Conference and Event Centre
Chester Zoo, Cheshire

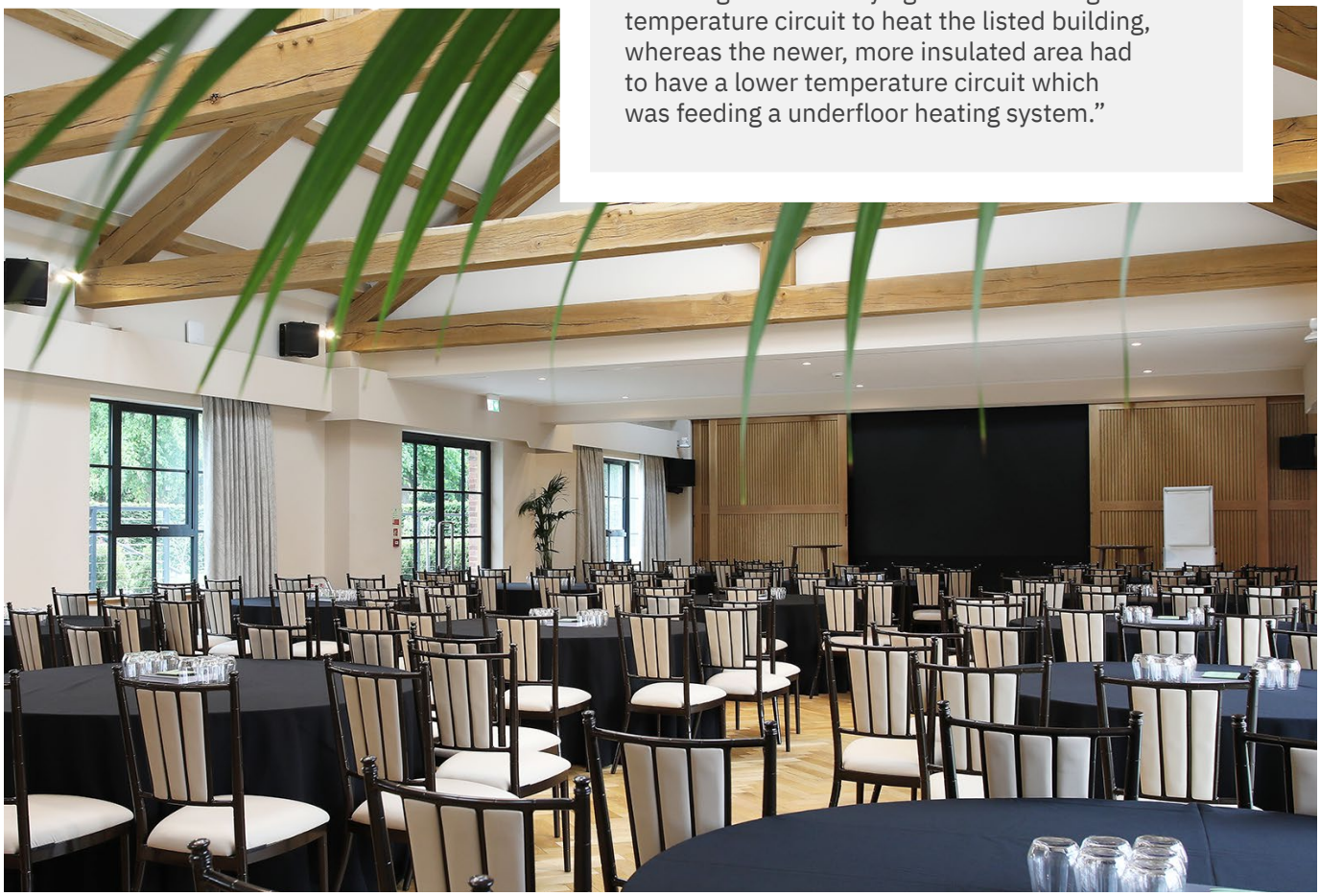
The Square conference and event facility was completed in 2023 and combines the historic Grade II-listed stables block - constructed in 1886, with a modern area that plays host to everything from conferences to gala dinners and product launches, seating 200 guests.

The stables were home to the zoo's first animal collection, including bears, monkeys, chimpanzees and reptiles, with the west wing of the stables used to house lions, so it is an iconic part of the Zoo.

The development makes for a stunning venue for weddings, product launches and meetings, but there was a particular challenge for the heating and cooling requirements, because parts of the building need high temperature heating for the Grade II listed elements, while the more modern elements need lower temperatures for the underfloor heating.

"The Square combines a conference space that is also used for weddings, plus some smaller spaces that are used for meetings and private functions in the older, listed-status areas and both elements have very different heating requirements," explained Rob Arathoon, Mechanical and Electrical Projects Manager at Chester Zoo.

"This presented some specific challenges to the design as we're trying to achieve a higher temperature circuit to heat the listed building, whereas the newer, more insulated area had to have a lower temperature circuit which was feeding a underfloor heating system."



The Square Conference and Event Centre
Chester Zoo, Cheshire

The solution sees two **Ecodan CAHV air source heat pumps** feeding a **Climaveneta EW-HT water-to-water heat pump** to provide a boosted temperature circuit. The CAHV units provide water at 45°C, with the EW-HT boosting the temperature to 75°C.

Together the heat pumps deliver very high temperature water for the radiators in the historic parts of the building and lower temperatures to serve the underfloor heating in the new part.

The Square also benefits from an **Ecodan QAHV air source heat pump** which delivers water temperatures of up to 90°C for use in the facility's kitchen and toilet areas.

Aside from meeting the heating requirement at the Square, the designers also faced the challenge of how to cool the conference area in the summer, which is where three highly efficient **Mr Slim R32 air conditioning systems** come into play to provide a cool temperature in an efficient manner when required.

The energy efficient air conditioning utilises R32 refrigerant which has a much lower global warming potential (GWP) and helps reduce the embodied carbon for the equipment.

The Square Conference and Event Centre
Chester Zoo, Cheshire

Chester Zoo opened in 1931 and is home to more than 37,000 animals and more than 500 species.

As part of its commitment to sustainability, the zoo has an ambitious target to be carbon net zero in its scope one and two emissions by 2030 and a critical part of this is decarbonising heat right across the 128-acre site.

"As a world-leading conservation and education charity, we know that we can't be part of the problem that we're trying to solve, so we are developing sustainable plans that help us reduce carbon emissions and achieve our net zero targets," explained Jennifer Kelly, Head of Sustainability at Chester Zoo.

"A major part of this is our partnership with Mitsubishi Electric and we're also keen that this helps to showcase the best of heat pump technology in some of the most challenging applications to inspire others to act."

Heat pumps will play an increasingly important role in the Zoo's decarbonisation programme and have already been installed in several animal habitats including those for the Eastern Black Rhino's and the Butterfly Habitat.

"The solution used at the Square goes to show that across the zoo's estate, it's not just about decarbonising animal habitats, it's also about decarbonising and using the most efficient technologies to provide heating and cooling for human spaces as well," added Chris Newman, Zero Carbon Design Manager for Mitsubishi Electric

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The Square Conference and Event Centre
Chester Zoo, Cheshire

Installation Summary

Outdoor Units:

- 2 x Ecodan CAHV monobloc air source heat pump working in a Cascade system
- 1 x Ecodan QAHV monobloc air source heat pump
- 1 x EW-HT water-to-water heat pump
- 2 x PUZ-ZM200/250YKA R32 Power Inverter Heat Pump
- 1 x PUZ-ZM35VKA2 R32 Power Inverter Heat Pump

Ecodan CAHV

Ecodan QAHV

EW-HT

PUZ-ZM200 / 250YKA R32

PUZ-ZM35VKA2

Indoor Units:

- 6 x PKA-M R32 wall-mounted indoor units

PKA-M

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Changes for the Better

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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.

Effective as of December 2025

Green Gateway greengateway.mitsubishielectric.co.uk