MITSUBISHI HEAVY INDUSTRIES

HOT WATER SOLUTIONS

Q-ton Air to Water

Case Study

WELLINGTON BOTANICAL GARDENS

PROJECT DETAILS
Wellington Botanical Gardens
Wellington, NZ

COMPLETION DATE
2022

SYSTEMS INSTALLED
2 x Q-ton Air-to-Water Systems
2 x 1,000L Stainless Steel Tanks

MHI REPRESENTATIVE
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PROJECT DESCRIPTION

Wellington Botanic Garden, a renowned 25-hectare botanical garden featuring unique landscapes, protected native forests, and specialized plant collections, is a key cultural and ecological site in Wellington, New Zealand. As part of the garden's efforts to reduce its environmental impact and become more sustainable, a decarbonisation initiative was launched in collaboration with Advance Building Services. This initiative aligns with the garden's certification as a Toitu CarbonZero organization, reflecting its commitment to minimizing energy consumption and carbon emissions.

PROJECT REQUIREMENTS & CHALLENGES

The garden required a sustainable heating solution for its glasshouses, where maintaining a controlled climate is crucial for the plants. The primary challenge was to find a cost-effective and sustainable space heating solution for the greenhouse without compromising the delicate plant collections housed within. The system needed to provide consistent heating, particularly during colder months, while meeting the garden's carbon reduction targets.

Additionally, the solution had to integrate with the existing infrastructure while maintaining the visual and ecological integrity of the surrounding areas, which included both heritage and native plant collections.

MHI'S SOLUTION

In collaboration with Advance Building Services, MHI provided a solution that featured two Q-ton air-to-water CO2 heat pumps, alongside two stratification tanks and a return tank. This combination was chosen for its high efficiency, eco-friendly operation, and ability to deliver reliable heating within the glass-house's specific temperature requirements. The Q-ton heat pumps use CO2 as a refrigerant, which aligns with the garden's sustainability goals, as CO2 has minimal environmental impact compared to traditional refrigerants.

The system's design allowed for a seamless transition to a sustainable heating model, with the heat pumps efficiently handling space heating even during colder periods. The success of this project demonstrated the effectiveness of air-to-water CO2 heat pumps for greenhouses and similar environments when designed within the correct parameters. Not only did the system meet the heating demands of the greenhouse, but it also contributed to significant energy savings and reduced carbon emissions.

The Wellington Botanic Garden's decarbonisation project serves as a model for other institutions aiming to adopt more sustainable practices while preserving critical operations..

Q-ton Air to Water

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