

Vancity Centre

Heat reclaim system reduces natural gas consumption 95 percent, greenhouse gas emissions 75 percent; results in \$85,000+ incentive • Vancouver, BC

Vancouver City Savings Credit Union, known as Vancity, is Canada's largest community credit union, serving the needs of more than 509,000 member-owners and their communities through fifty-nine branches. With environmental sustainability one of its guiding principles, Vancity is committed to energy efficiency, strives to do business in the most sustainable way possible, and is working hard to reduce its environmental footprint.

Challenge

The Vancity Centre building (built in 1995) was relying solely on natural gas boilers for space and water heating. In alignment with its commitment to sustainability, when its aging boiler plant was in need of upgrade, reducing natural gas consumption and greenhouse gas emissions were top priorities.

Solution

Having a relationship with Trane that spanned many years, Vancity discussed the credit union's upgrade and energy saving needs with the company. Trane evaluated the 115,000 square foot Vancity tower that houses a large data centre containing network computer systems and servers. For optimal climate conditions, the data centre required year-round cooling, and was generating a lot of residual heat that was being vented into the atmosphere.

Recovering and reusing waste heat

Rather than replacing the current boiler, Trane proposed a creative design build solution that would recover and reuse waste heat captured by the data centre's cooling system to heat the entire Vancity building. The solution would use a heat reclaim chiller and allow the credit union to reduce the size of the facility's boiler. To demonstrate the technology, Trane and Vancity Facility and Environmental Management staff visited a nearby site using a similar Trane system.



A 5,500 lb Trane® Series R™ Helical Rotary heat reclaim chiller, designed to boost the low grade heat generated from the centre, was hoisted to the rooftop mechanical room. Photo credit: Chris Goodchild/SES Consulting.

Collaboration and incentives

Interested in the heat reclaim solution, Vancity engaged SES Consulting to evaluate the energy savings potential of this retrofit concept, and seek incentive funding support from Fortis BC through their Commercial Custom Design Program. SES worked with Trane engineers to verify design details and prove the feasibility of the heat recovery system. In collaboration, Trane and SES developed the sequence of operation to maximize the use of heat recovered with this design and provided an Energy Study for Fortis BC to enable funding support for this project.

Overcoming timing and installation challenges

With the building located in a high-pedestrian, high-traffic area, with a SkyTrain line running under it, timing was key. The Trane installation team worked in the early hours of the morning to remove the existing chiller. Using a crane, the 5,500 pound Trane® Series R™ Helical Rotary heat reclaim chiller was hoisted twelve stories into the air to the roof. With its compact size, the narrow chiller fit easily through the rooftop mechanical room's 32-inch doorway.

Providing reliability and efficiency

Trane technicians completed installation of the 80-ton Trane® Series R™ Helical Rotary heat reclaim chiller, as well as new constant volume pumps and piping. The building's aging boiler was replaced with a smaller boiler. With only two rotating parts, the chiller's low speed, direct drive Helirotor™ compressor offers reliability, and helps to reduce energy costs, with an industry-leading heat recovery efficiency of 4.2 COP (coefficient of performance) at 140°F (60°C).

Results

Installing a Trane® Series R™ Helical Rotary heat reclaim chiller to recover and reuse waste heat captured by its data center cooling system allowed Vancity to heat its entire head office building, demonstrating its commitment to energy conservation. The reclaim system and a small natural gas boiler work together to provide heat, with the majority of space heating provided by the heat reclaim system. Reduced cooling



Trane® Series R™ Helical Rotary heat reclaim chiller provides the Vancity Centre building with reliable, energy efficient operation.

tower and pump usage have partially offset the energy required to operate the chiller. The heat reclaim system has reduced the building's natural gas consumption by 95 percent, or 5,000 GJ, and greenhouse gas emissions from this source by 75 percent. Vancity's energy efficiency efforts have resulted in a rebate incentive from Fortis BC of more than \$85,000. Expected payback on the project is 4.5 years.

"When we learned we could capture and reuse waste heat, making the decision was a no brainer for us. Minimizing our carbon footprint is a priority. This new heating system let us accomplish something dramatic," said Jeremy Trigg, Vancity Director of Facilities and Environmental Management.



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