AMPED Sports Lab and Ice Complex / Modern Niagara Group, Inc.

As a national mechanical and electrical contractor operating in six major markets, Modern Niagara Group, Inc. understands the environmental challenge presented to us – but also understands the immense opportunity this provides. For over 20 years, Modern Niagara has been analyzing, developing, and implementing energy conservation measures for buildings. This historical knowledge, coupled with our commitment to innovation, has enabled Modern Niagara to build for life – to build for future generations and their communities, to build for a greener environment, one that can thrive. It's this commitment that drove Modern Niagara to partner with AMPED Sports Lab and Ice Complex, and allowed it to become the first Zero Carbon Building™ - Performance Standard certified arena, through the Canada Green Building Council®'s Zero Carbon Building™ Program.

AMPED Sports Lab and Ice Complex is a sports and physiotherapy facility located in Ottawa, Ontario. This state-of-the-art facility includes and ice rink, physiotherapy clinic, and high-level training area. AMPED provides training and recovery programs, including physiotherapy, to high-performance athletes.

Modern Niagara began with a lofty goal - to eliminate as much carbon-based energy consumption as possible and move towards a zero-carbon building. Modern Niagara targeted all of the mechanical systems that consumed natural gas and subsequently emitted carbon into the atmosphere to earn the ZCB-Performance certification. This included the ice rink dehumidifier, the hot water heater, and the rooftop air handling units.

All fossil fuel consumption related to building energy use was eliminated on-site and converted to electric-based alternatives. Custom-designed and built rooftop units (RTUs) were manufactured with heat pumps and electric heat backup instead of the traditional direct expansion (DX) coil and gas-fired burner to achieve the goal. Also, the ice arena dehumidification system was retrofitted with a unique, custom-built liquid dessicant air-conditioned unit, equipped with refrigeration DX system reheat. These custom units provided the highest possible efficiency while helping to drastically reduce greenhouse gas (GHG) emissions. Also, the gas fired domestic water heaters were replaced with heat pump water heaters.

To better manage building performance, including the ice-making process, a robust automation and metering system was installed. Used in combination with a real-time analytics software package, it optimizes building and process control and performance, enhances maintenance services, and assists in the continuous commissioning of the facility to ensure energy savings persist.

The Chiller system that is used to make ice for the rink also had an energy optimization automation system installed to ensure run times and sequencing are automatically adjusted to drive efficiencies. Heat reclaim from the Ammonia based chiller was considered however the ROI was excessive for the low amount of high-temperature heat available.

The lighting systems were also retrofitted to high-efficiency LED and to provide clean electricity a 136 kW solar photovoltaic array was installed.

This project represents a critical milestone for our industry. Recognizing that every building is unique, the path to a zero-carbon building is also unique. If a hockey and sports-dedicated facility in a city where temperatures vary by over 80 degrees (Fahrenheit) can become zero carbon, imagine the possibilities for other buildings across Canada and the world.