Quality curling ice with energy savings

Result

- New condenser strategy results in 37% energy savings
- Emerson E2 supervisory controller adds an additional 26% energy savings
- Copeland Scroll™ compressors and electronic expansion valves yield another 31% energy savings
- Overall 66% energy reduction between 2012-2019
- Ice temperature fluctuations of less than 1°F

Application

Curling is a sport in which players slide 42 lb (19 kg) polished granite stones on a sheet of ice towards a target area 100 ft (30 m) away. The purpose is to accumulate the highest score for a game; points are scored for the stones resting closest to the center of the house at the conclusion of each end, which is completed when both teams have thrown all of their stones.

The player can induce a curved path, described as curl, by causing the stone to slowly turn as it slides. The path of the rock may be further influenced by two sweepers with brooms, who accompany it as it slides down the sheet and sweep the ice in front of the stone. "Sweeping a rock" decreases the friction, which makes the stone travel a straighter path (with less "curl") and a longer distance.

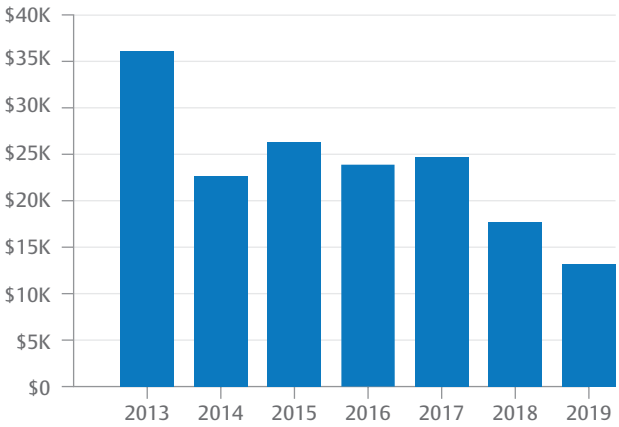
According to the Ontario Recreation Facilities Association, curlers will use any combination of the following terms to describe their ice – flat, tricky, greasy, slow, fast, keen, frosty, sticky, swingy, straight, good, bad or terrible.

Customer

The Paris Curling Club in Ontario, Canada recently celebrated its 175th Anniversary. The Paris Curling Club is a member of the Ontario Curling Association.

Oxford Energy Solutions (OES) is a leading commercial, industrial and agricultural HVACR service company located in Ontario, Canada.

Paris Curling Club Electricity Costs



Curling club operates 6 months per year. Energy savings are based on the 6 month operating period.

EMERSON™

Challenge

There are thousands of curling clubs across North America. Whether they operate a dedicated curling facility or play in an arena where other ice sports are played on the same surface, the electricity to run the necessary refrigeration systems is often the largest expense.

The floor is typically cooled using recirculation of either a chilled glycol/water mixture or a brine solution to a temperature of 18 to 20 degrees Fahrenheit. The key to great ice is consistency through the curling event, even with varying heat loads. Curlers are known to be particular about their playing surface and want to be able to throw the same type of shot with the same amount of curl and speed in the first game versus the last game.

The Paris Curling Club was spending over $36,000 annually on electricity. The Club contacted Oxford Energy Solutions to evaluate its refrigeration system and make recommendations for energy savings.

Solution

Evaluation and optimization of the refrigeration equipment started in 2012. A new condenser was installed with features such as a variable frequency drive, floating head pressure, optimized refrigerant receiver and a subcooling loop on the condenser. A new variable frequency drive was installed on the brine system. These improvements resulted in 37% energy savings.

In 2016, a new control strategy was implemented using Emerson E2 supervisory controls and energy monitoring. Another 26% energy savings was realized. Finally, the refrigeration system was replaced with new Copeland Scroll compressors and electronic expansion valves and superheat controllers. Energy usage was reduced another 31% for an overall 66% energy reduction from 2012-2019. Unacceptable ice temperature swings of 4°F before are now less than 1°F.

Supervisory controls from Emerson provide building and system management, control, power and simplified operation for refrigeration, HVAC, lighting, and more in large facilities. Effective deployment of supervisory controls delivers operational efficiency, cost savings, and the best conditions for customers and staff.

Supervisory controls also collect, analyze, report and communicate performance history and metrics. These include temperatures, energy usage, HVAC discharge and space temperatures and more. That means facility and enterprise managers can quickly respond to issues that may impact the customer experience or operating costs

Copeland Scroll technology remains at the forefront of HVACR applications with its superior efficiency, reliability, ease of installation, horsepower capacity range and options in low-, medium and extended-medium temperature equipment.

We are constantly looking at ways of exceeding our customers' expectations. With Emerson's industry-defining controls we are able to consistently deliver on those goals. The Emerson electric expansion valve is probably the best thing that's come along in refrigeration in a very long time. It's the only product that allows full system modulation while optimizing evaporator efficiency.

Emerson's electronics are the key to providing our customers increased reliability while reducing their overall carbon footprint and energy bills. That's why we consider Emerson a partner in providing solutions.

BEN KUNGL
President, Oxford Energy Solution Inc.

Resources

Learn more about Emerson Cold Chain solutions at:
Emerson.com/ColdChain