



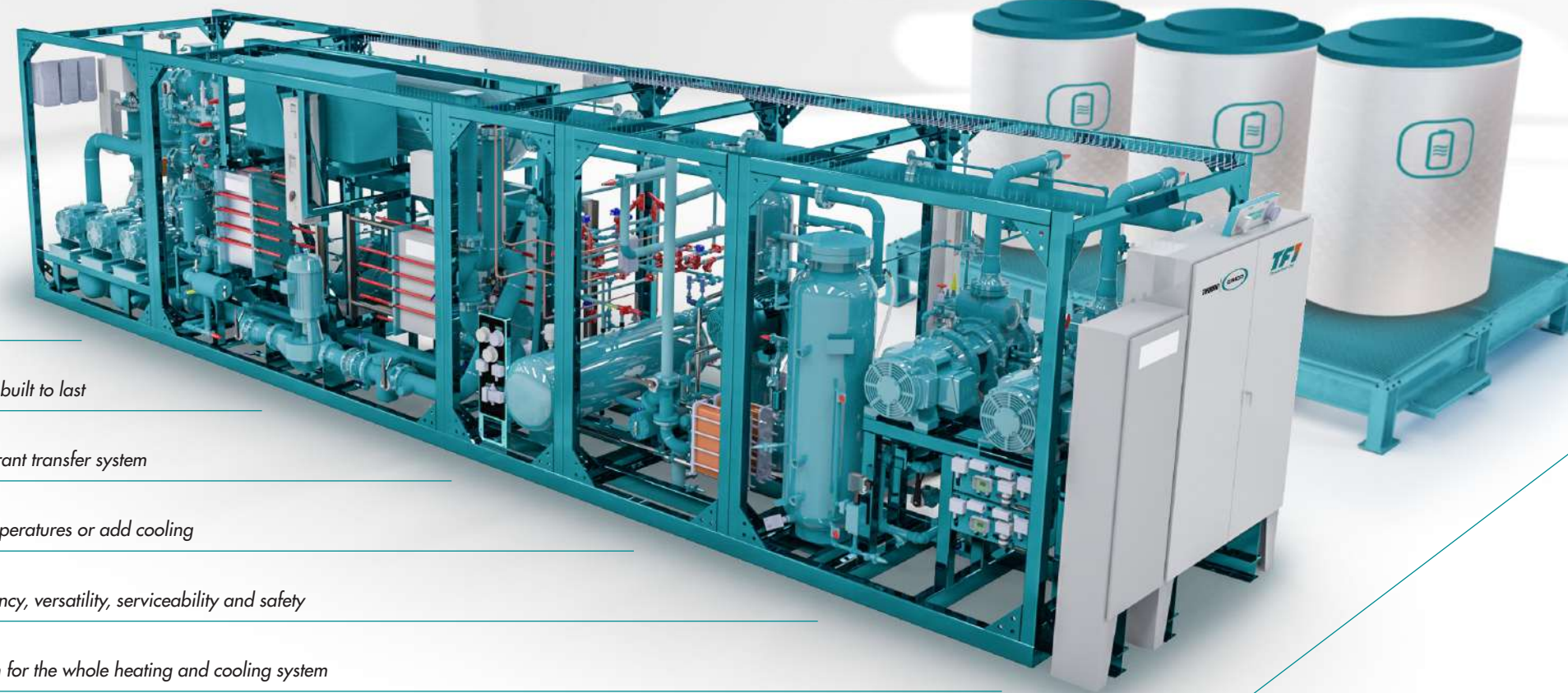
GETTING TO NET-ZERO IS EASIER THAN YOU THINK.

Upgrading your arena equipment is a necessary step, whether it has reached the end of its life or you are looking for more sustainable options. But it doesn't have to be a complicated process. With over 100 years of experience designing thousands of ice rinks, CIMCO has developed the industry's most efficient, sustainable, and safe industrial-grade ice rink refrigeration system to ensure your arena is prepared for the fast approaching net-zero future.

TF1

EXPERIENCE THE FUTURE OF ICE RINKS WITH THERMAL FORCE ONE.

Introducing the CIMCO Thermal Force One system - the all-in-one game-changer for ice rink thermal management. Purpose-engineered to make your transition to net-zero as seamless as possible, this cutting-edge thermal system harnesses the most advanced refrigeration technology available, ensuring professional-grade ice, maximum efficiency, and reduced dependency on natural gas.



SYSTEM COMPONENTS

Pumps Pre-configured for optimal performance

Heat Exchanger Highly efficient, industrial grade, built to last

CIMCO Smart Transfer Rapid emergency refrigerant transfer system

CIMCO Thermal Boost Ability to heat at high temperatures or add cooling

Compressors Industrial grade, designed for efficiency, versatility, serviceability and safety

CIMCO iQ+ Energy management automation system for the whole heating and cooling system

CIMCO Ice Batteries Heating and cooling storage

✓ ALL-IN-ONE TURNKEY SOLUTION

✓ 100% WASTE HEAT CONVERTED

✓ ICE BATTERIES STORE EXCESS HEAT AND COLD

✓ AUTOMATIC LEAK RESPONSE

✓ AIR QUALITY CONTROL FOR OPTIMAL ICE

✓ ULTRA LOW-CHARGE AMMONIA ZERO GWP



CIMCO THERMAL BOOST

With the inclusion of CIMCO Thermal Boost technology, TF1 takes efficiency and cost-effectiveness to a whole new level. Fully automated and integrated, this thermal pump anticipates your heating and cooling needs, providing a cooling boost when necessary and a heating boost at higher temperatures.

Unlike conventional systems, Thermal Boost can provide heat up to 175°F (77°C), converting **100% of the waste heat** generated by the refrigeration system into **usable heat**, potentially **reducing natural gas consumption and emissions to zero**. When heating is not needed, the Thermal Boost can be used as an additional compressor for cooling while maximizing efficiency and cutting costs.



CIMCO iQ+

Transform the way you manage your ice rink with the iQ+ Control System - the cutting-edge control system for your entire facility's operations. With an intuitive interface and sharp graphical representation, you can assess the status of the entire thermal system with ease.

The iQ+ offers seamless access for multiple users, allowing you to **manage the ice rink from anywhere in the network at anytime**. With advanced features including historic trending capabilities, alarm logging, and email or text message alerts, the system helps optimize rink operations.

But that's not all - the iQ+ Control System also boasts the capability to recover from system failure conditions, ensuring your ice rink stays up and running without any disruptions. Its advanced control strategies are intuitive, maximizing performance and efficiency while minimizing energy costs.



CIMCO SMART TRANSFER

Smart Transfer is a safety product that helps protect stakeholders by **sensing a refrigerant leak and containing it within the system**. In addition to an automatic response, the Smart Transfer can also be manually engaged to reduce risk during routine maintenance activities.



CIMCO ECO DRY

This system is a state-of-the-art ventilation and dehumidification system that also doubles as a heating system for indoor ice rinks. **It uses outdoor air to improve the environment inside, and effectively controls temperature and humidity levels** for optimal air quality, ice quality, and comfort, no matter the outside air conditions.



CIMCO ICE BATTERY

TF1 includes a thermal storage system that stores excess heat (or cold) in the form of ice. Depending on the facility's needs, stored thermal energy can be used to **reduce energy consumption** and related costs during times of peak demand - providing peak cooling in the summer or stored heat in the winter.



LOW-CHARGE AMMONIA

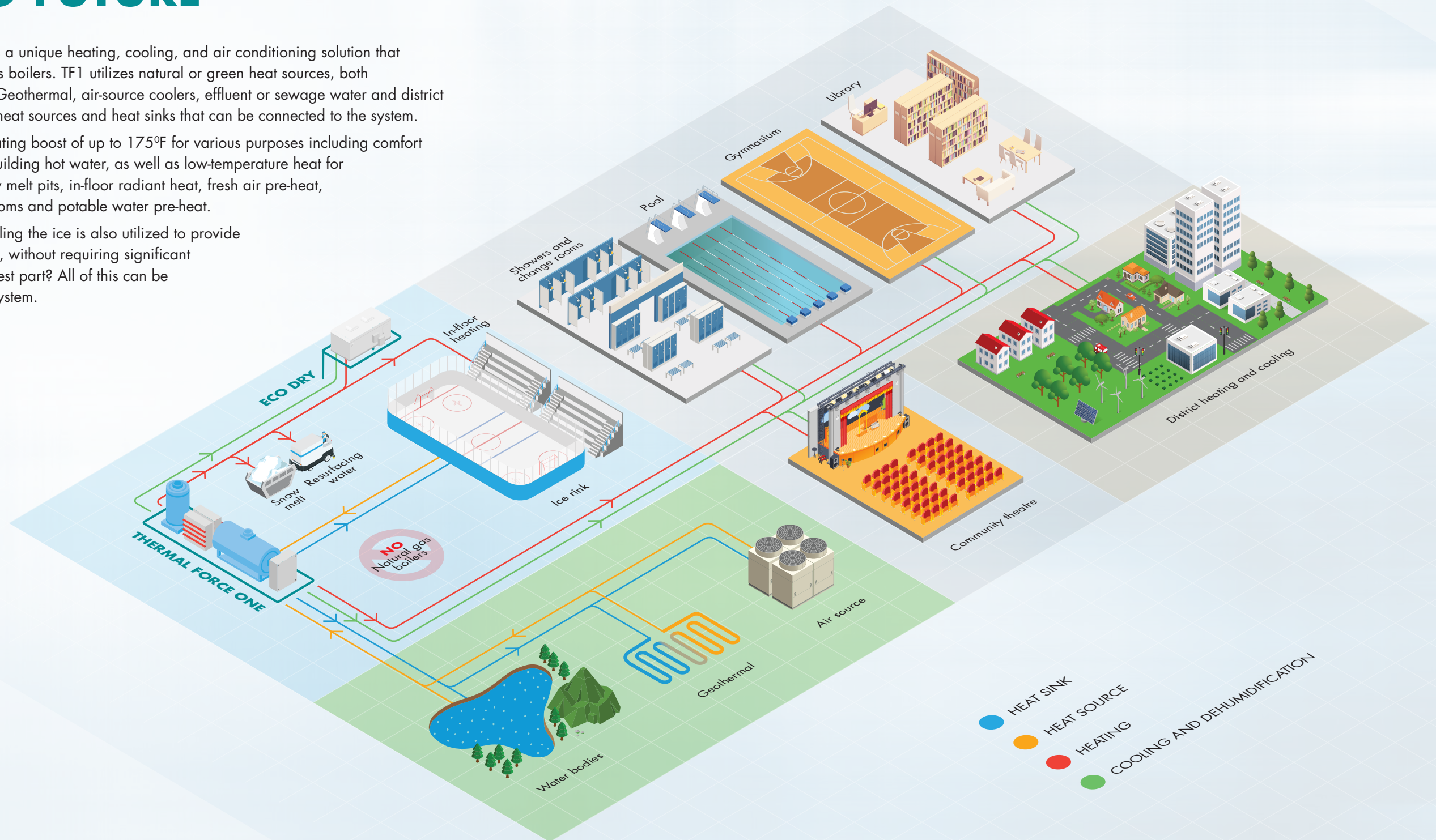
Ammonia (R717) is a natural refrigerant with an ODP and GWP of zero. Known for optimum energy efficiency, heat recovery, and reliability, TF1 takes it one step further by reducing the overall ammonia charge in the system. With an ultra-low ammonia refrigerant charge of **less than one cylinder per sheet**, The TF1 improves overall efficiency and safety and greatly reduces the risk of potential exposure due to refrigerant leaks.

UNLOCKING THE POTENTIAL OF THERMAL MANAGEMENT FOR A NET-ZERO FUTURE

Thermal Force One (TF1) offers a unique heating, cooling, and air conditioning solution that reduces reliance on natural gas boilers. TF1 utilizes natural or green heat sources, both on-package and off-package. Geothermal, air-source coolers, effluent or sewage water and district energy are some examples of heat sources and heat sinks that can be connected to the system.

With TF1, you can enjoy a heating boost of up to 175°F for various purposes including comfort heating, ice resurfacing and building hot water, as well as low-temperature heat for under-ice frost protection, snow melt pits, in-floor radiant heat, fresh air pre-heat, rinks, gyms, pools, dressing rooms and potable water pre-heat.

The same process used for cooling the ice is also utilized to provide air conditioning where needed, without requiring significant additional capacity. And the best part? All of this can be achieved with just one single system.





PERFORMANCE AND PEACE OF MIND.



NEXT GENERATION THERMODYNAMIC DESIGN

The future may not be certain, but this system is.

- Built to last, easy to operate and low maintenance
- Versatile Thermal Boost Technology with integrated air source
- Ready for on-site renewable energy



RESPONSIBLE ENGINEERING

Ammonia ice rink safety: protection meets peace of mind.

- Ultra-low charge ammonia for increased safety
- Built-in Smart Transfer sensor detects and immediately contains potential leaks
- Fusion welded system for maximum security



CUTTING-EDGE CLIMATE TECHNOLOGY

Building a net-zero ice rink requires innovation.

- Upgrade free waste heat to provide high-grade heat for your facility instead of natural gas
- Includes seamless real-time energy monitoring for better distribution
- Eliminates the financial risk associated with rising energy costs, refrigerant patents & phase-outs, and carbon taxes
- Aligns with guidelines for net-zero grants and funding

READY WHEN YOU ARE.

Not all projects can get to net-zero right away – but by providing a solution for the entire building through HVAC integration, the TF1 can serve as a foundational investment into your net-zero future when you upgrade your facility.

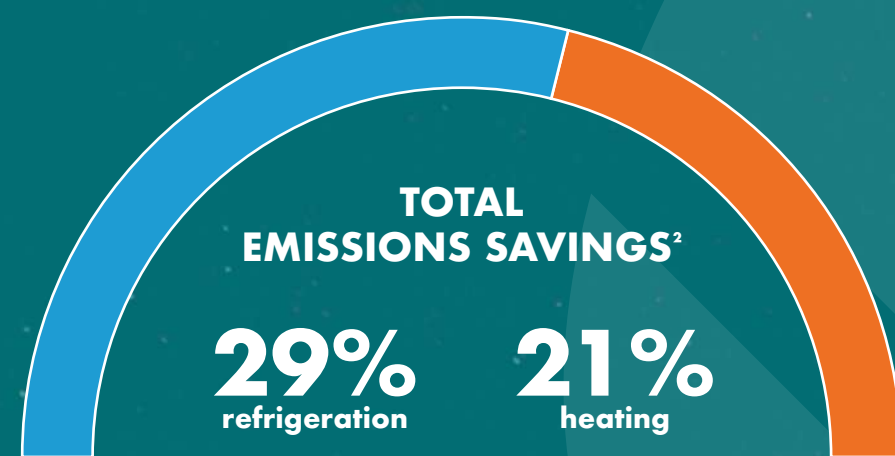
MAKE A BIG IMPACT ON YOUR EMISSIONS.

Indoor ice rinks use large amounts of energy for heating and refrigeration. These buildings are often the largest greenhouse gas (GHG) emitters and typically account for around 40% of the energy usage in municipal building portfolios.¹ That is why they are a great place to start your net-zero retrofits.

By using a natural refrigerant like ammonia (R717), an arena immediately reduces its direct emissions to zero as it has no Ozone Depleting Potential (ODP) or Global Warming Potential (GWP). To tackle indirect emissions from energy use, having a state-of-the-art integrated heating and cooling system that uses waste heat to reduce the reliance on natural gas, can make a significant impact.

In fact, real case studies have proven that the most emissions savings in an arena can be found by improving its refrigeration system (29% of emission savings) while heating improvements can realize 21% of emission savings.²

TF1 incorporates all of these features to provide maximum impact and ensure the lowest emissions for your facility – today, tomorrow and until the end of equipment life.



¹ Federation of Canadian Municipalities (FCM), "Factsheet: Building-level solution"
² Green Municipal Fund, FCM, "Taking your indoor ice rink to net-zero"

LEADING THE WAY TO A CARBON-NEUTRAL FUTURE



Recognized as a leader in sustainable refrigeration, CIMCO Refrigeration is North America's largest supplier of thermal solutions catering to industrial, recreational and commercial sectors. Renowned as a forerunner in providing environmentally-friendly ice systems, we take pride in our ability to engineer world-class technology and deliver outstanding service to our customers.

CIMCO has designed, engineered and installed more than 200 ECO Chill systems to date. Taking the learnings from this experience and the thousands of other installations we have done, we have designed the new Thermal Force One to meet a clear need in the ice arena sector.

Throughout our legacy of more than 100 years, we have been leaders in designing and implementing innovative and future-ready solutions. We are committed to our vision to be your first choice for systems and services in thermally-controlled environments.

With TF1, we can now deliver all of the efficiency, performance and sustainability of CIMCO technology in a single turn-key solution.

READY TO TAKE THE NEXT STEP TOWARDS NET-ZERO?

Contact us today to learn more about CIMCO Thermal Force One.

[CIMCOREFRIGERATION.COM/TF1](https://cimcorefrigeration.com/TF1)