PIRANHA™
THERMAL ENERGY RECOVERY SYSTEM
ABOUT OUR OPERATIONS

International Wastewater Systems was founded in 2010 in Vancouver, B.C. by a team of technical and engineering professionals with over 100 years of combined experience in the heating, ventilating and geo-exchange industries.

The business is engaged in the Design, Build, Finance and Operation (DBFO) processes of implementing wastewater thermal energy exchange systems, at the individual building level as well as via district heating / cooling. IWS has developed several proprietary turn-key systems including the SHARC™ and PIRANHA™ and have installed these solutions across Canada, USA, UK and Australia.

Why Recover Energy Going Down The Drain?

Wastewater is a constant and inexhaustible resource that can carry ~25% of a building’s daily energy consumption and which in most cases is being allowed to go to waste into the sewer system.

When discharged from buildings, wastewater is higher in temperature than most other regenerative energy sources such as well water or geo-exchange, reaching an average temperature of between 15°C (59°F) and 21°C (69°F) at the point of discharge.

The wastewater then runs within the sewer system and stays at a fairly constant temperature of between 14°C (57°F) and 18°C (64°F) prior to reaching the wastewater treatment facility.

Across North America and the European Union alone there is over 330 billion liters (8.7 billion US gallons) of wastewater discharged through the sewer system each day. This wastewater has the potential to replace over 1.5 billion MWh of the natural gas consumption used to provide space heating and domestic hot water every year.

As a result of the research and development carried out by International Wastewater Systems access to the waste heat in this resource is now possible, creating the ability to:

1. Recover the waste heat and provide highly efficient heating and cooling to individual buildings.

Or

2. Adopt a wider view of a city’s sewage infrastructure and utilize the sewage system to develop low cost/low carbon district heating solutions.
Clean, Eco friendly, Renewable Water Heating - Without Carbon Emissions

Operational Cost Savings - Fast ROI

Robust Design with Minimal Maintenance Required and Long Product Life-cycle (25 Years+)

The PIRANHA™

International Wastewater Systems has established itself as a world leader in the thermal energy recovery industry, having proved economic viability of the concept with numerous installations of its patented SHARC system worldwide.

Following the success of the SHARC, the IWS team is proud to introduce its newest system: the PIRANHA to complement the existing product range and cater to smaller scale applications.

The PIRANHA is a self-contained thermal energy recovery system specifically designed to pre heat domestic hot water by re-using energy contained in wastewater that would otherwise be lost down the drain.

A first of it’s kind in the HVAC market the PIRANHA is primed to redefine green building innovation.

The system is suitable for a wide range of applications including multi-unit residential and commercial buildings.

The PIRANHA operates at efficiencies of 400-600% and supports green building objectives, delivering zero emission water heating.

PIRANHA PERFORMANCE

1100 Room Hotel & Convention Center (Feasibility Outcome)
Orlando, Florida

Operational Savings

Two PIRANHA 160 units recycling the warm wastewater discarded from the hotel and convention center provides an estimated annual savings of $19,691 for domestic hot water heating during the first year of operation, generating an ROI of 20% for the client.

The PIRANHA system operating at an average COP of 5 covers up to 40% of the annual net energy demand for domestic hot water preparation.

Energy Security

The annual energy cost savings is expected to increase annually with inflation and offers the facility price stability against the fluctuating costs of fossil fuels.

Supports Green Building Culture

In addition to the operational cost savings, the client was able to attain mandated green building requirements for the project by offsetting carbon emissions with the PIRANHA system.
Seven35 is a collection of 60 stacked urban residential townhomes. The building is designed to LEED® Platinum certification. IWS wastewater heat recovery technology is a cornerstone feature of the sustainable design.

- The PIRANHA delivers 80% of the domestic hot water heating load.
- Annual performance factor: 5.
  (The ratio of thermal energy supplied by PIRANHA system to the amount of electricity required to operate the system for one year.)
The PIRANHA uses a direct refrigeration process where the incoming warm wastewater provides the refrigeration circuit the energy to output hot domestic water.

The PIRANHA system contains the following components:
1. Auxiliary Wastewater Storage Tank with Submersible Pump(s)
2. The PIRANHA
3. Domestic Pre-Heat Storage Tanks
4. Domestic Circulation Pump(s)
The PIRANHA thermal heat recovery system received the 2016 AHR Expo® Innovation Award for Green Building Innovation.

The AHR Expo® is the world’s largest HVACR convention. The annual AHR Expo® Innovation Awards competition honors the most inventive and original products, systems and technologies showcased at each year’s Show in the categories of: building automation; cooling; green building; heating; indoor air quality; plumbing; refrigeration; software; tools & instruments; and ventilation.

IWS was chosen by a panel of third-party judges from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) who evaluated all award entries based on innovative design, creativity, application value and market impact. The award further demonstrates the adoption of IWS technology within the green building sector in the United States and globally.
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