Wastewater Energy Transfer

Powering a clean future for small communities

SHARC ENERGY

COMPANY OVERVIEW

SHARC Energy headquartered in Port Coquitlam, BC, Canada

Founded in 2010, by a team of engineering professionals with significant experience in the HVAC & Geo-Exchange and Plumbing industries

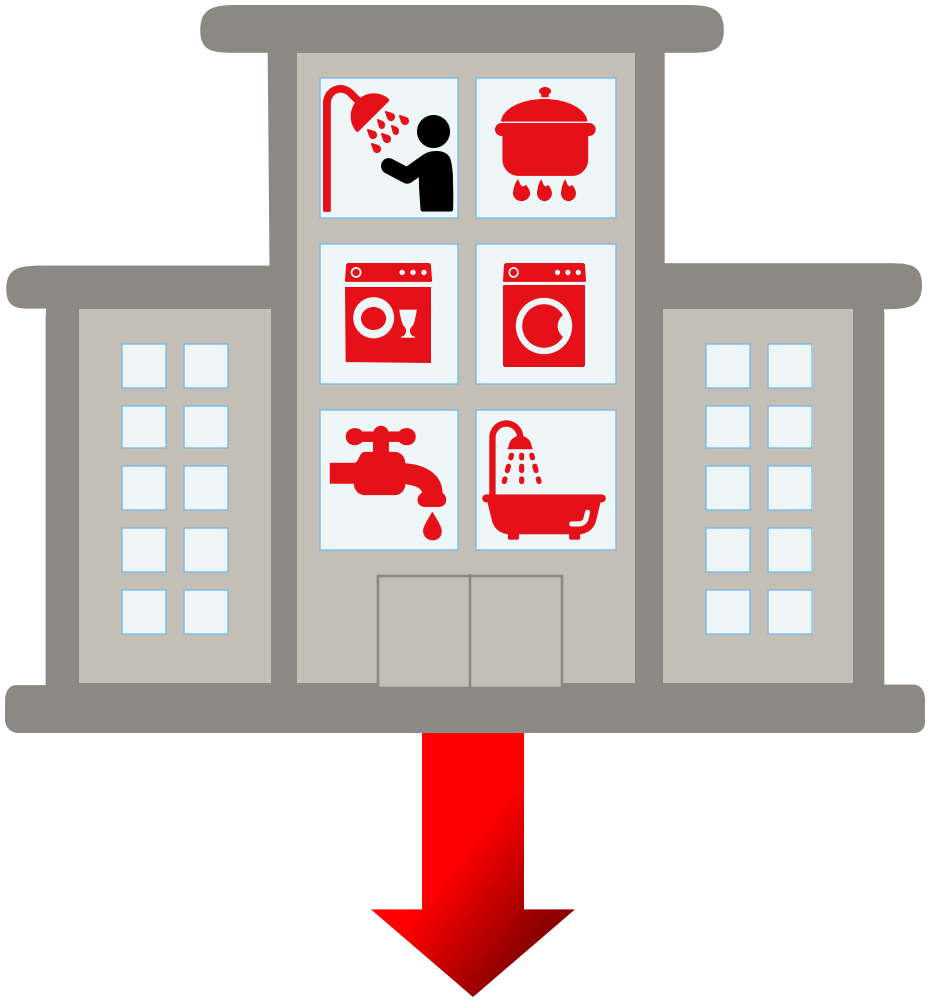
Developed its first product: the 'SHARC' in 2011

In 2016, released second product the 'PIRANHA' for smaller scale applications

In 2019, released 'PIRANHA HC'

How can communities stop the cycle of waste?

MULTI-FAMILY, COMMERCIAL
OR APARTMENT BUILDING



Thermal needs can account for ~50% of a building's total energy demand.

This number is only rising.

The Average Person Uses **30 Gallons** of **Hot Water** per Day at 120°F*

- Average Residential Wastewater Temperature is 70°F
- Commercial & Industrial Wastewater Temperature can reach 140°F or Higher

Wastewater sources:

- Black and Grey Water Within Buildings
- Sanitary Sewers
- Lift Stations/Treatment Centres

**estimated 60 gallons/day of wastewater*

Why Wastewater?

- Limitless Energy Source Material
- Consistent Temperatures Year-Round

Reduce

- Energy Losses from Buildings
- Energy Use & Operational Costs
- GHG Emissions

High Efficiency Electrification

- Market Demand
- Local & Federal Legislation
- Utility Incentive Programs

What to Use?

PIRANHA SERIES

- All in one wastewater-source heat pump
- Active energy recovery
- **Small footprint**
- **No odor**

Residential

- Multi-unit housing, 50–-500 units
- Student Housing
- Senior Living
- Community Housing

Commercial

- Hospitals
- Micro-Breweries
- Hospitality
- Commercial Laundry & Car Wash

Industrial

- Commercial Food Production
- Pulp and Paper
- Textiles
- **District Energy**

SHARC SERIES

- High capacity
- High volume filtration
- Uses custom heat exchanger
- **Small footprint**
- **No odor**

The PIRANHA Series

The PIRANHA is a self-contained heat pump that uses a specifically designed direct expansion heat exchanger to recover thermal energy from a building's wastewater for domestic hot water heating

Models: T5 / T10 / T15

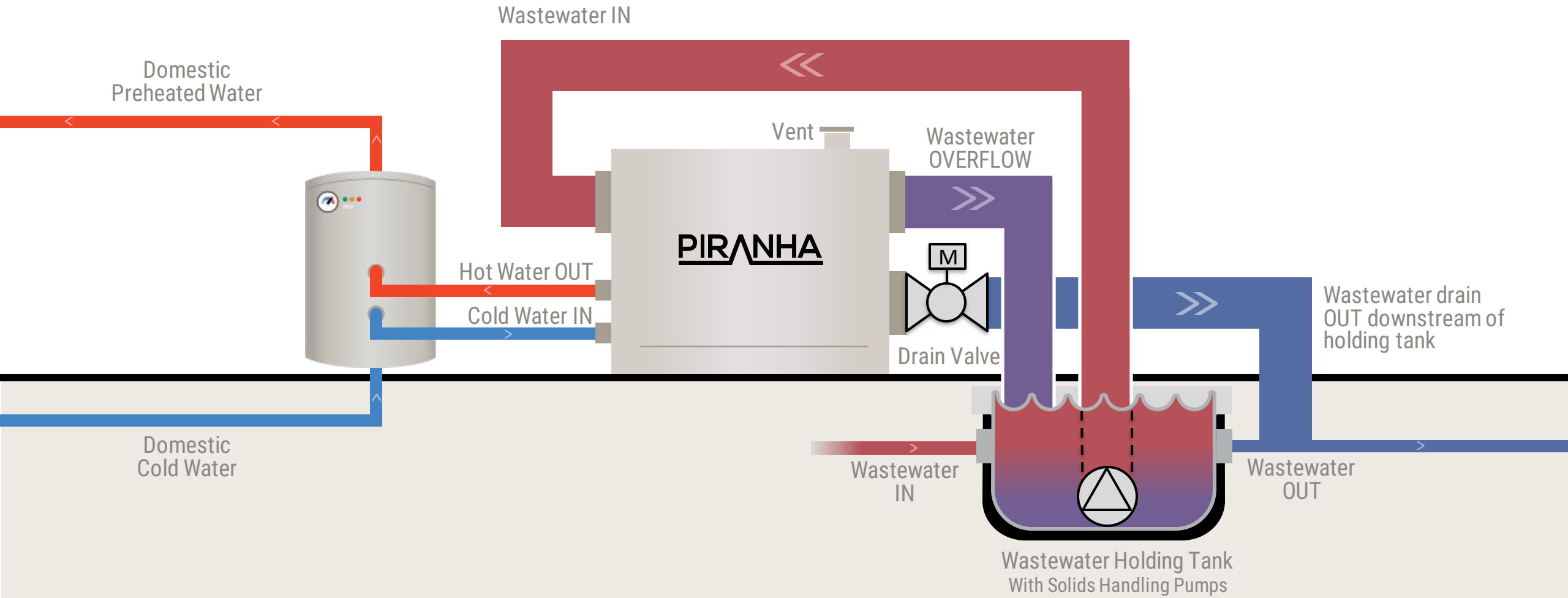
- Design heat output
  - **60 / 120 / 180 MBH**
  - Increase output scalable with multiple units
- Designed to fit through standard double door
- Average COP of 3.5*
- **NSF-372 rated BPHE**
  - Double-wall, leak detection
- R-513a
  - 56% Lower GWP than R-134a (573 vs 1,430)
  - Same performance
- Completely Sealed System – **Odor Free**

*Average COP across a range of source temperatures, output temperatures and application types.

How PIRANHA Works

Energy Recovery (Heating)

Typical Above-Grade PIRANHA Installation



Lake Louise Inn

Lake Louise, Alberta

SHARC

CASE STUDY

- 247 room Hotel
- PIRANHA T10 recovering heat from 4 commercial laundry washing machines
- Produce an average of **1700 Gallons** of Hot water per day
  - ✓ **Average COP of 5.25**
- Main fuel source – Propane
  - ✓ **Saves 6,000 gallons/year**
  - ✓ **GHG emission reduction of approximately 35 t CO2e/year**

Seven35

North Vancouver, BC

SHARC

CASE STUDY

- The first multi-family LEED® for Homes Platinum building in Canada

- Certified BuiltGreen Gold
- 60 Residential Units
    - **PIRANHA T10** Commissioned Spring 2016
    - **9,350 Therms Natural Gas reduction**
    - **GHG Emission reductions of approximately 49.6 t CO_2e/year**

- PIRANHA system provides domestic hot water preheating

- Piranha contributed to LEED® Platinum certification of the building

- **Currently PIRANHA HC EPRI Challenge Site**

Seven35

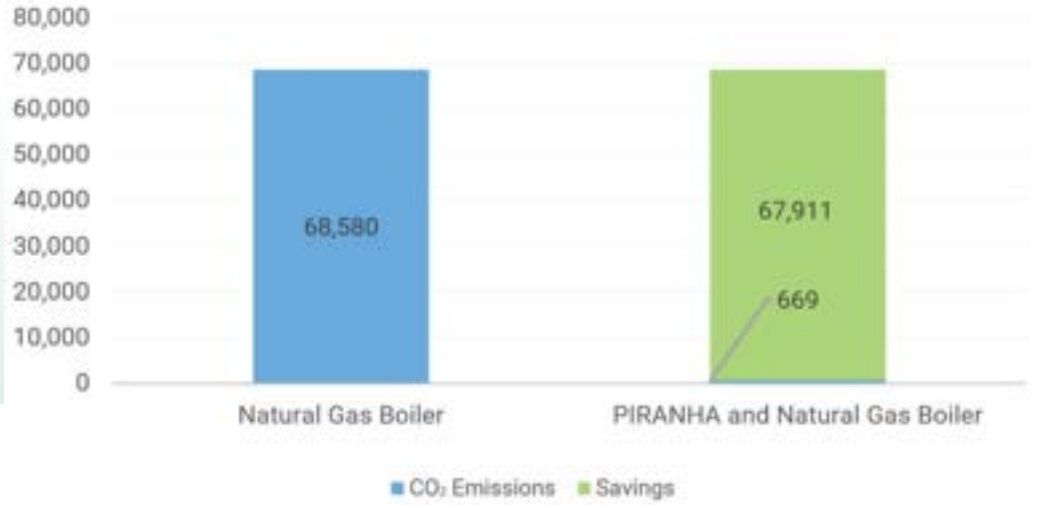
North Vancouver, BC

SHARC

CASE STUDY

ANNUAL ENERGY COSTS & SAVINGS

CO2 EMISSIONS (KG/YEAR)



SHARC

Series

- Designed to allow for high flow rates and ease of service.
- **Variable Use**
  - **DHW (Domestic Hot Water)**
  - **Space Conditioning**
    - Heating (Energy Recovery) or Cooling (Energy Rejection)
  - **Wastewater Cooling**
  - **Geo-Loop conditioning and/or Geo-field offset**
- Exponential efficiency for low-temp loops
  - Up to MW of energy transferred for low kW energy input
- Completely Sealed at Installation Site – **Odor Free**

SHARC

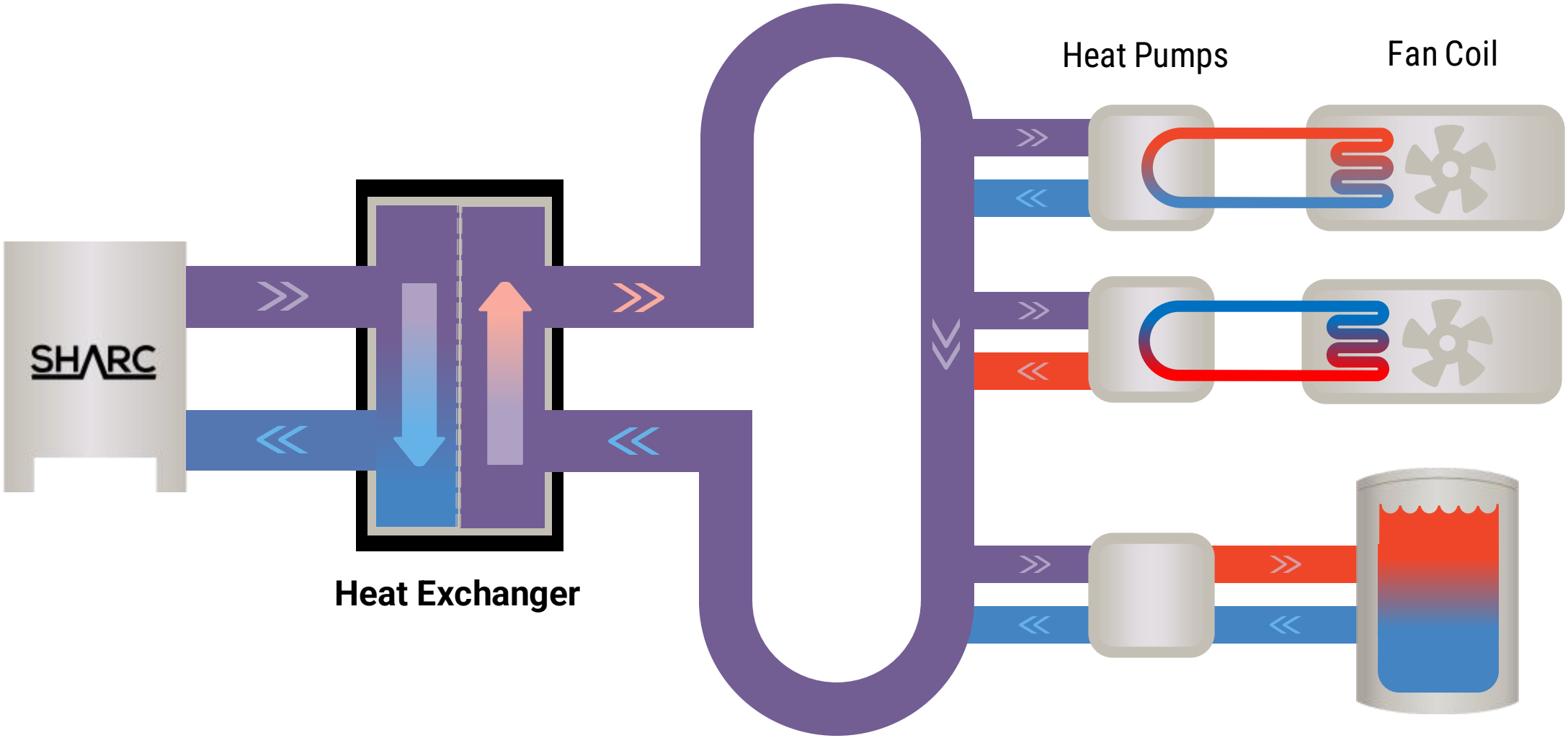
SYSTEM

- SHARC Filter Unit
- Support Frames/Skids
- Control Panel
- Macerator/Grinder
- Piping/Valve Assembly
- Plate & Frame Heat Exchanger
  - Wide Gap
- Wastewater Holding Tank & Solids Handling Lift Pumps
  Existing Tank can be used
- Heat Pump
  - May not be needed in ambient/low temp systems

*Sourced Separately

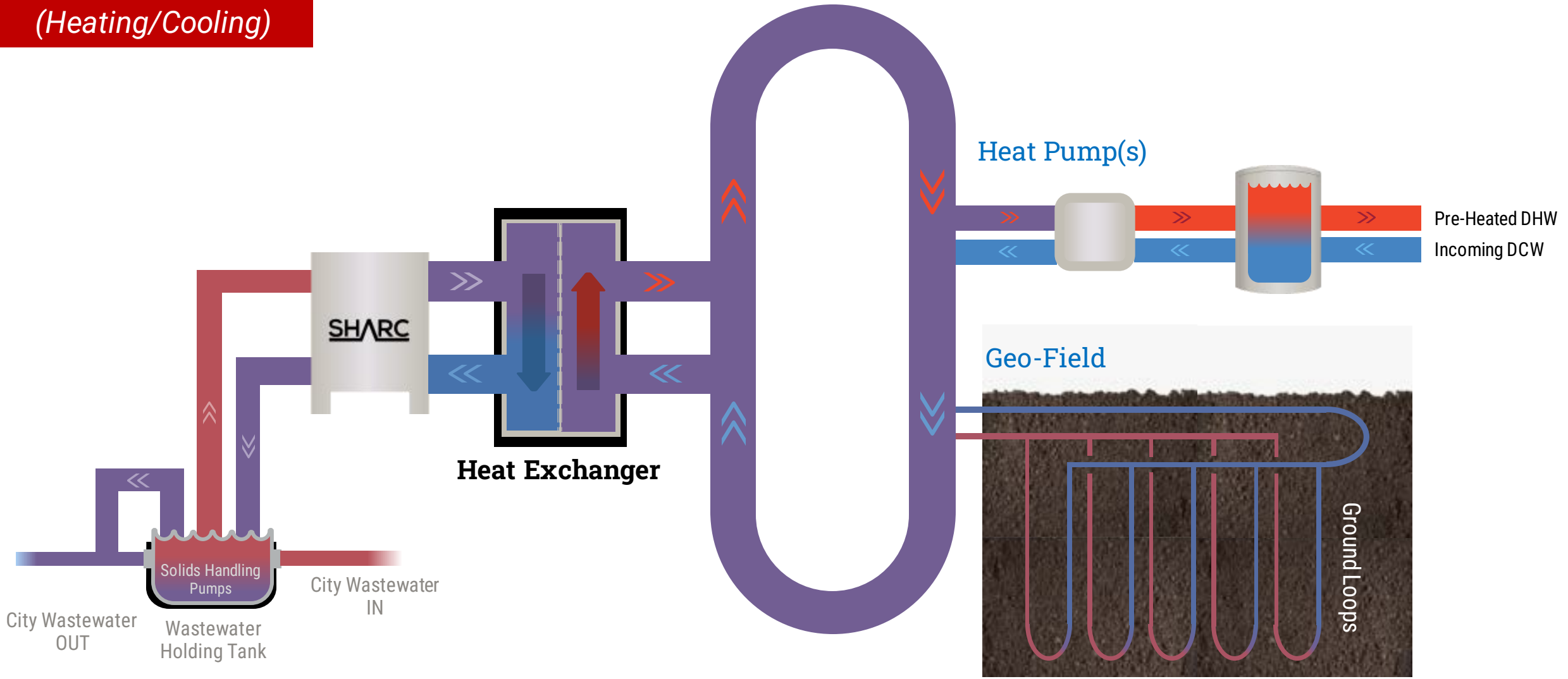
How SHARC Works

Multi-Use (Heating/Cooling)

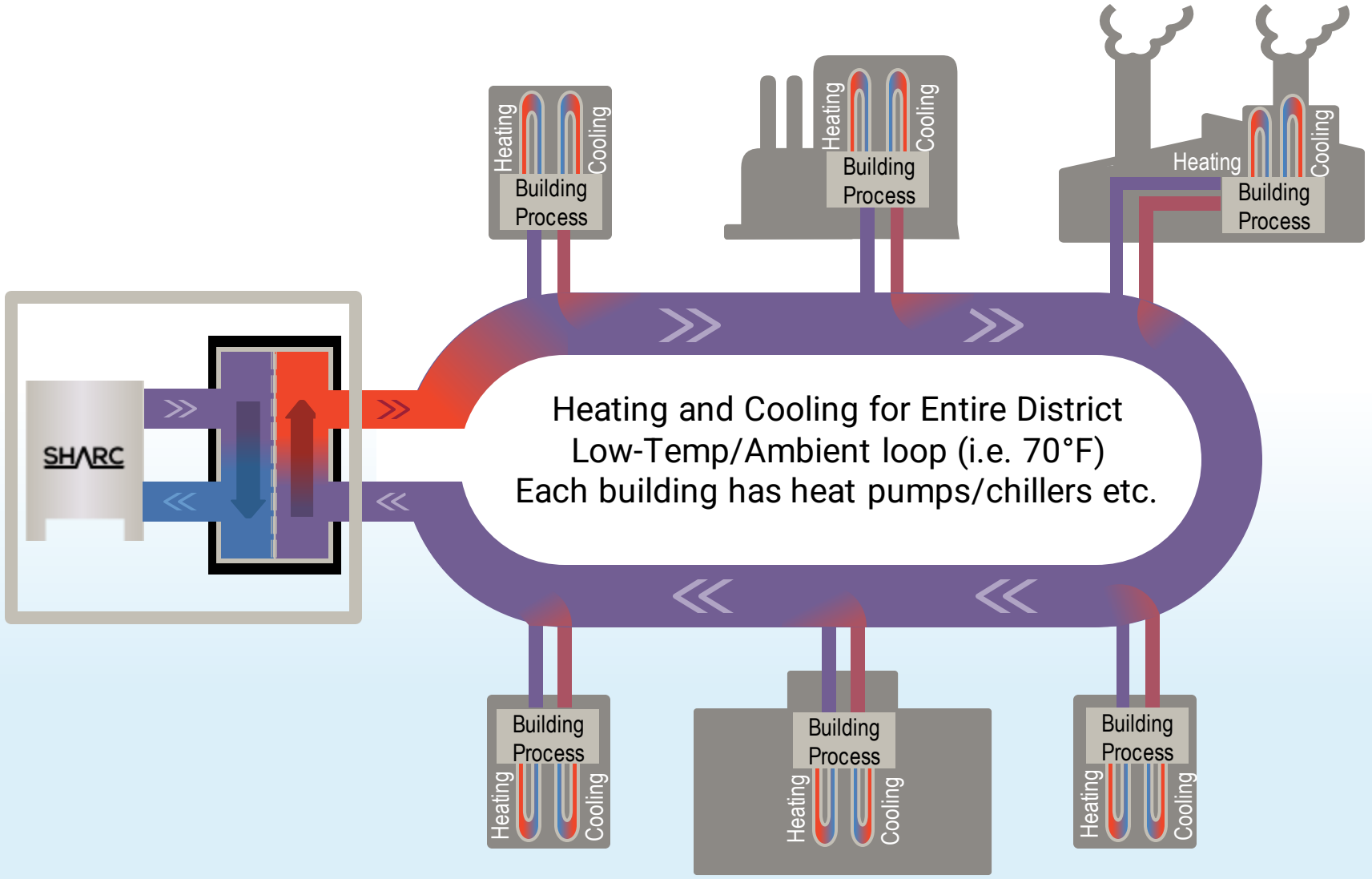


How SHARC Works

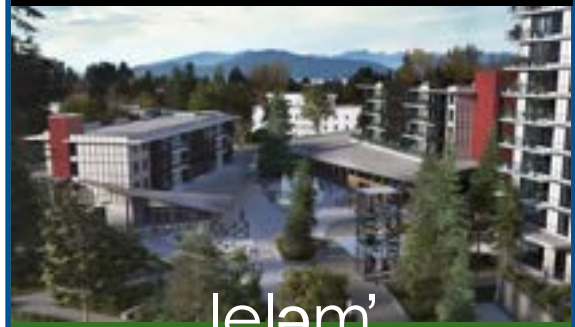
Geothermal-Paired Multi-Use (Heating/Cooling)



District Energy Example



SHARC project highlight



lelәm’

- 22-acre development, 1.3M sq ft
- 30,000 sq ft commercial, including grocery store
- 1,300 residences
- 10,000 sq ft of daycare
- 15,000 sq ft of Community Centre

Inflation Reduction Act 2022

- Greenhouse Gas Reduction Fund: $27 billion in grants to act as seed capital to mitigate climate change
- Investment Tax Credit (ITC): Up to 30% for low carbon energy projects
- Production, Investment Tax Credit Bonuses
  - ✓ Up to 10% bonus for meeting domestic content requirements
  - ✓ Up to 10% bonus for projects in low-income communities & tribal lands
- $2.3 Billion funding for grid modernization & resilience projects

SHARC ENERGY

Turn Your Wastewater into Opportunity.

Questions? Aaron.Miller@SHARCenergy.com

www.SHARCenergy.com