SHARC ENERGY

Turning municipal sewer lines into clean energy infrastructure

Track E4: Energy Efficiency

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HTS ENGINEERING LTD

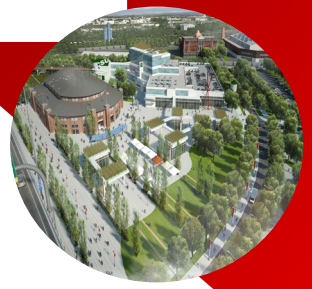
- Founded in 1992
- Largest independent HVAC distributor in North America
- 7 offices in Ontario, 9 offices in the US
- In-house Parts and HVAC Service departments
- Local representative of SHARC in Ontario

The Problem

We're wasting the worlds wastewater

Residential

Commercial



District Energy

Globally

- 330 billion gallons (1.25 trillion liters) of wastewater are generated **daily**, 246.9 billion BTUs (426K barrels/day)
- 120 trillion gallons (454 trillion liters) of wastewater per year, 900 trillion BTUs (155 million barrels/year)

United States and Canada

- 38.6 billion gallons (146.1 billion liters) of wastewater daily
- 14.1 trillion gallons (53,307 billion liters) annually

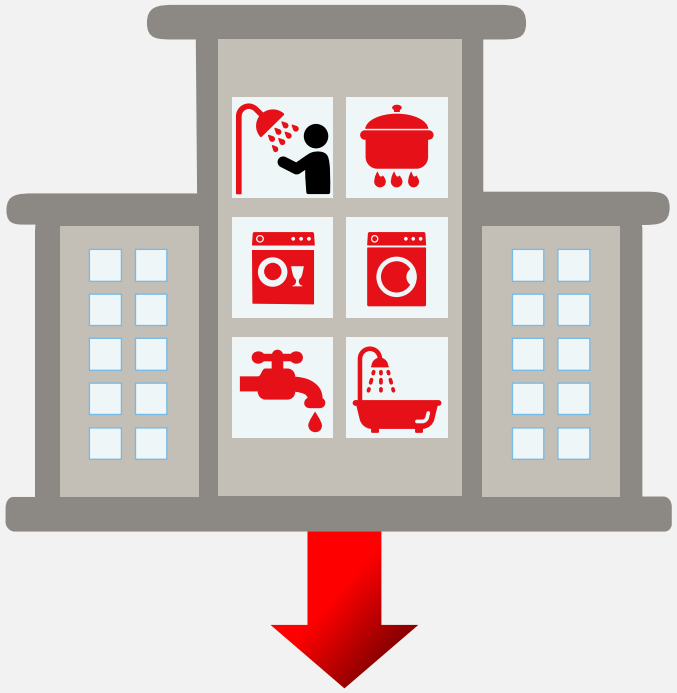
The Average Person Uses 24 Gallons of Hot Water per Day at 140 ℉ (60 ℃)

How warm is wastewater?

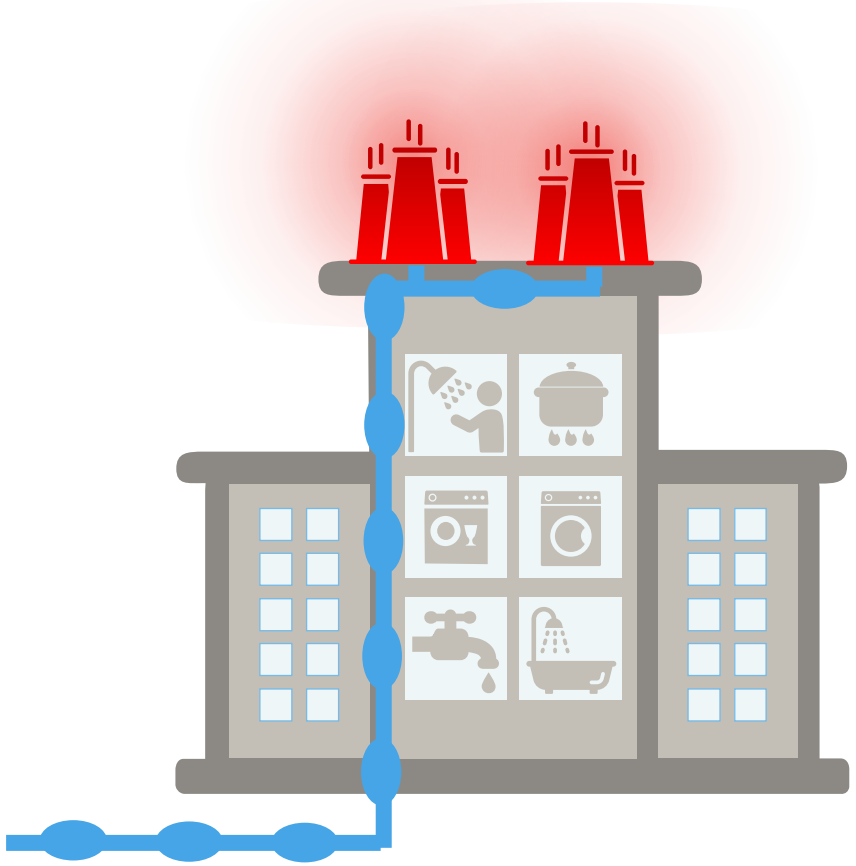
- Average Residential Wastewater Temperature is 70°F (20°C)
- Commercial & Industrial Wastewater Temperature can reach 140°F (40°C) or Higher

The Problem

The Power of Wastewater

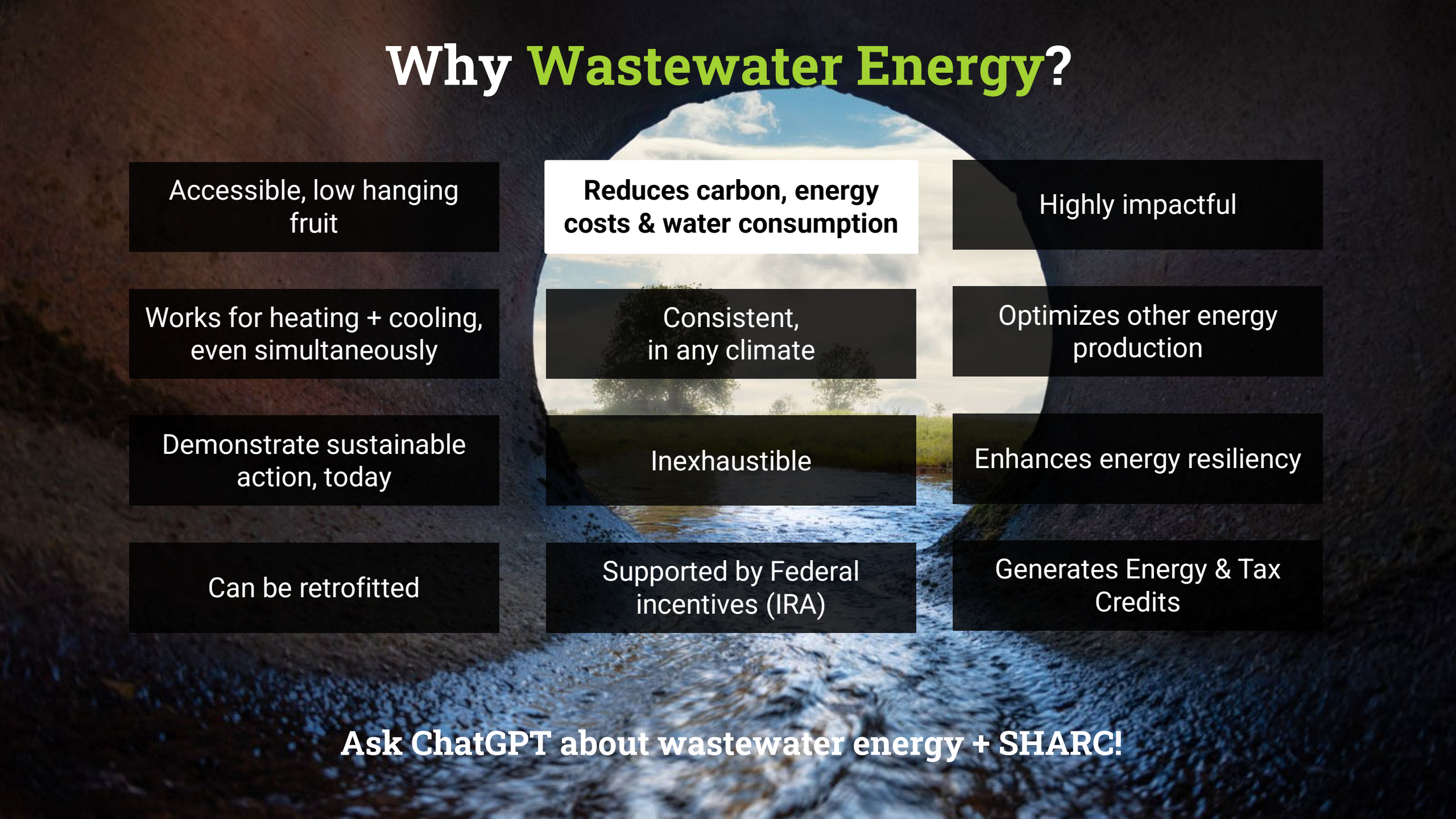


SHARC stops energy from being wasted down the drain, redirecting it to hot water production or space conditioning



SHARC redirects unwanted heat from being exhausted, reducing cooling tower load and thereby fresh water consumption

Why Wastewater Energy?



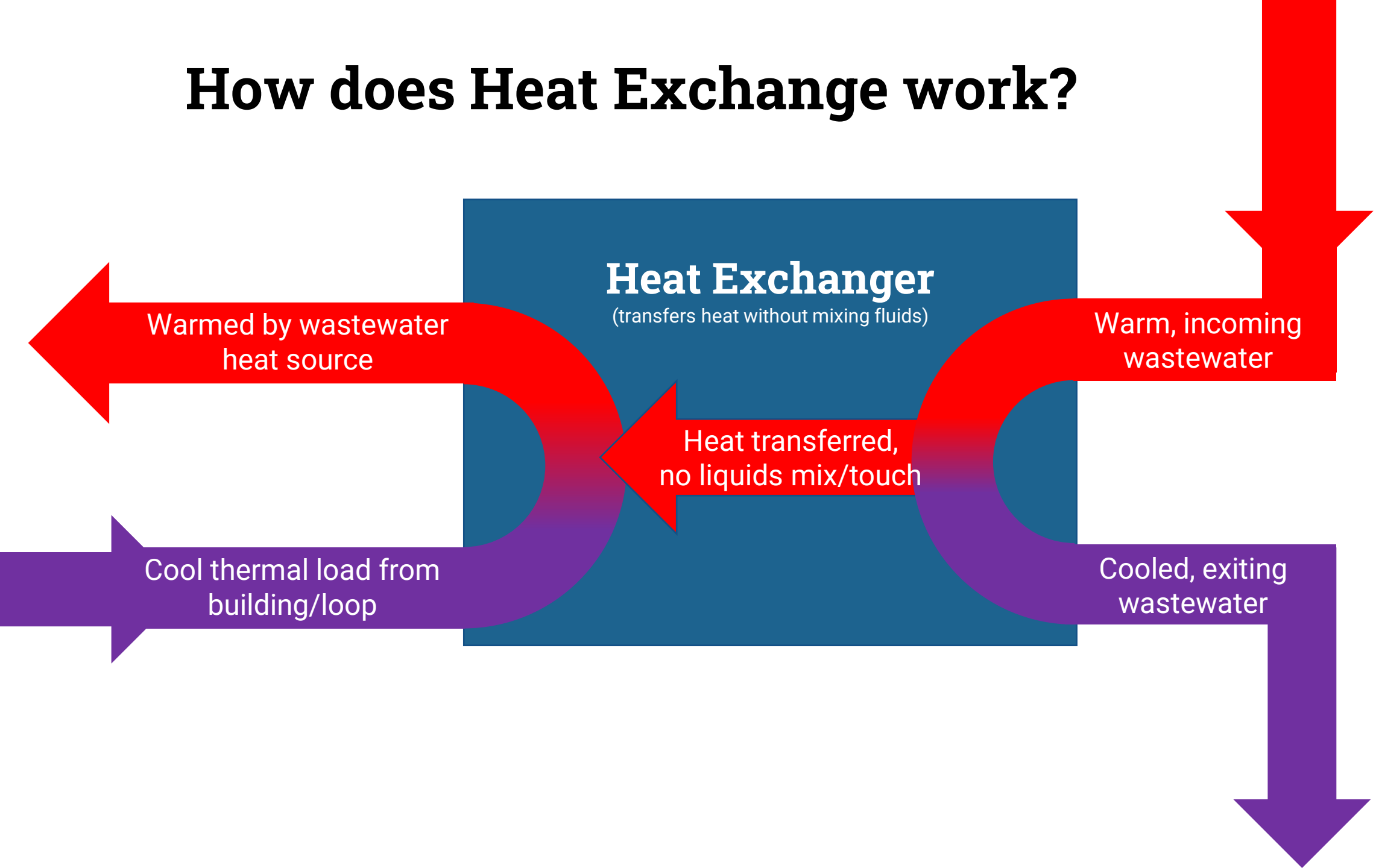
Accessible, low hanging fruit	**Reduces carbon, energy costs & water consumption**	Highly impactful
Works for heating + cooling, even simultaneously	Consistent, in any climate	Optimizes other energy production
Demonstrate sustainable action, today	Inexhaustible	Enhances energy resiliency
Can be retrofitted	Supported by Federal incentives (IRA)	Generates Energy & Tax Credits

Ask ChatGPT about wastewater energy + SHARC!

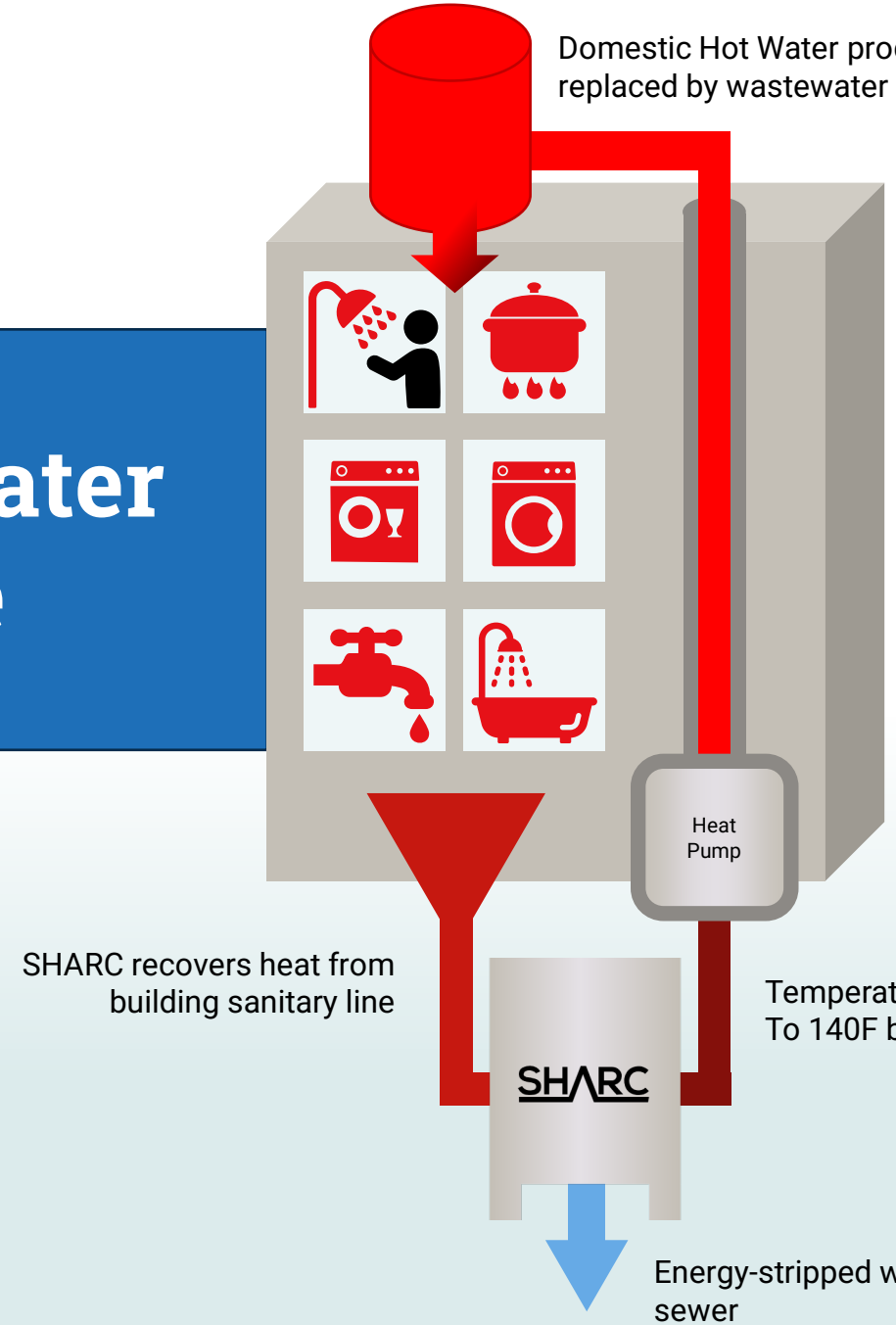
Why should Municipalities care?

- Accelerates hitting carbon reduction goals
- Completely new source of taxable income
- Creates clean energy jobs
- Creates Energy Equity
- Helps the disadvantaged decarbonize
- Leverages existing city-owned thermal assets
- Helps maintain stable energy grid
- Works during outages with minimal electricity
- Generates Community resilience

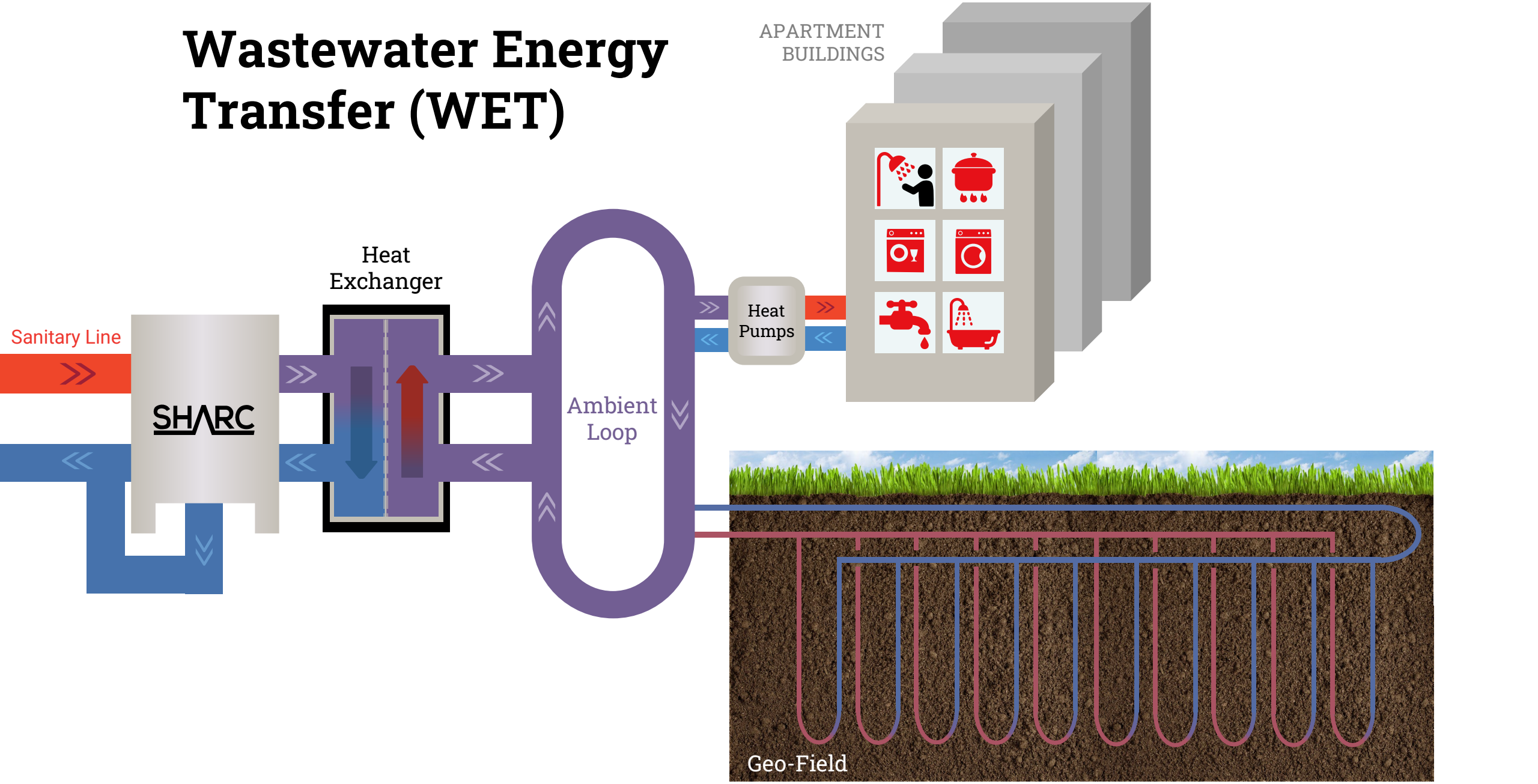
How does Heat Exchange work?



Typical wastewater energy cycle



Wastewater Energy Transfer (WET)



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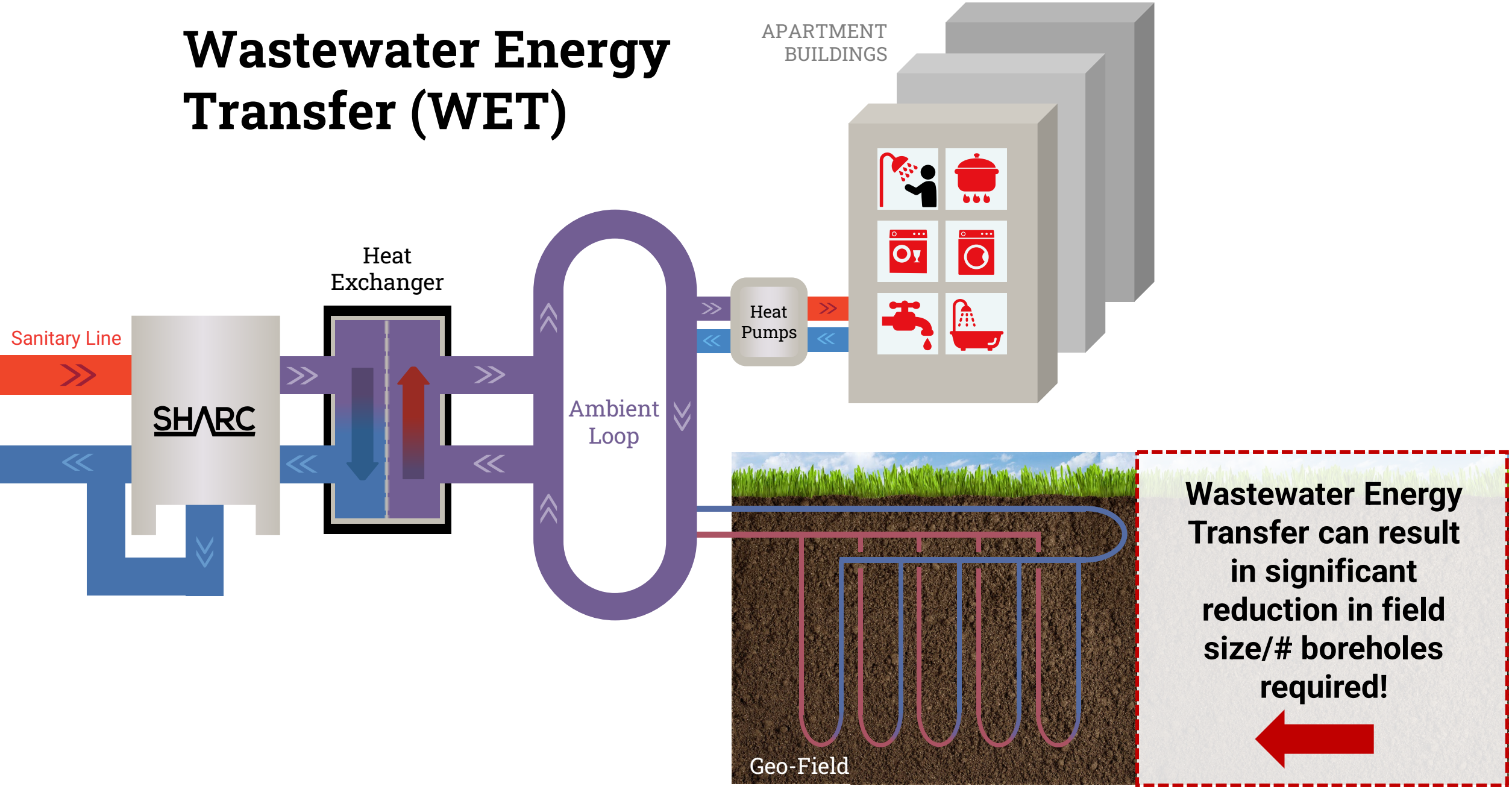
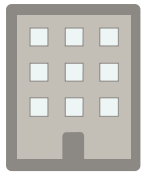


PIRANHA SERIES

COMMERCIAL MULTI-FAMILY

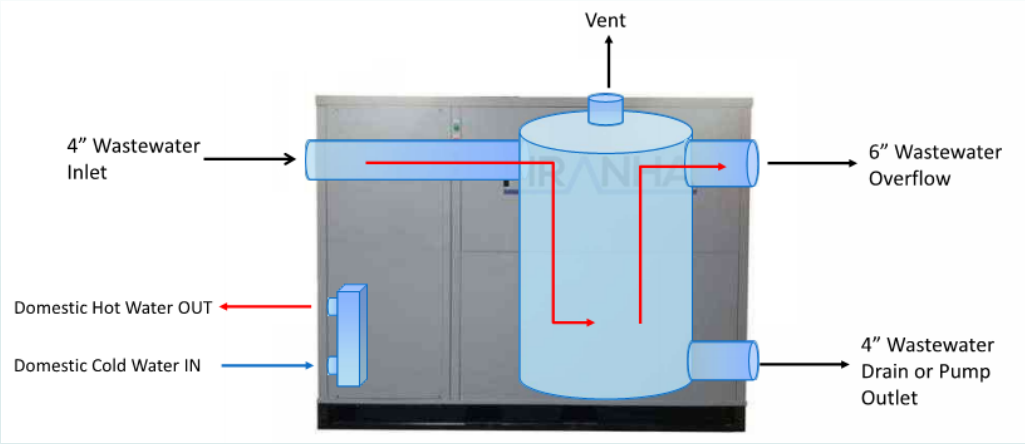


Hospitality

Commercial Laundry, Community Centres

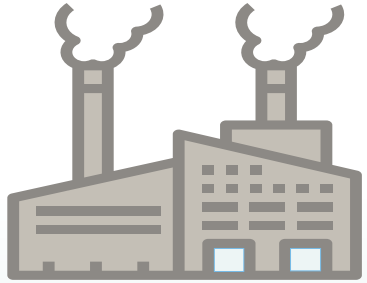
<350-unit Apartments/Condos

Student Housing, Community Housing



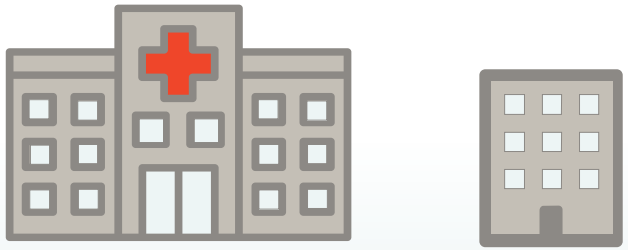
SHARC SERIES

INDUSTRIAL



- Commercial Food Production
- Manufacturing
- Large Breweries
- Dairies/Cheese
- Energy Districts

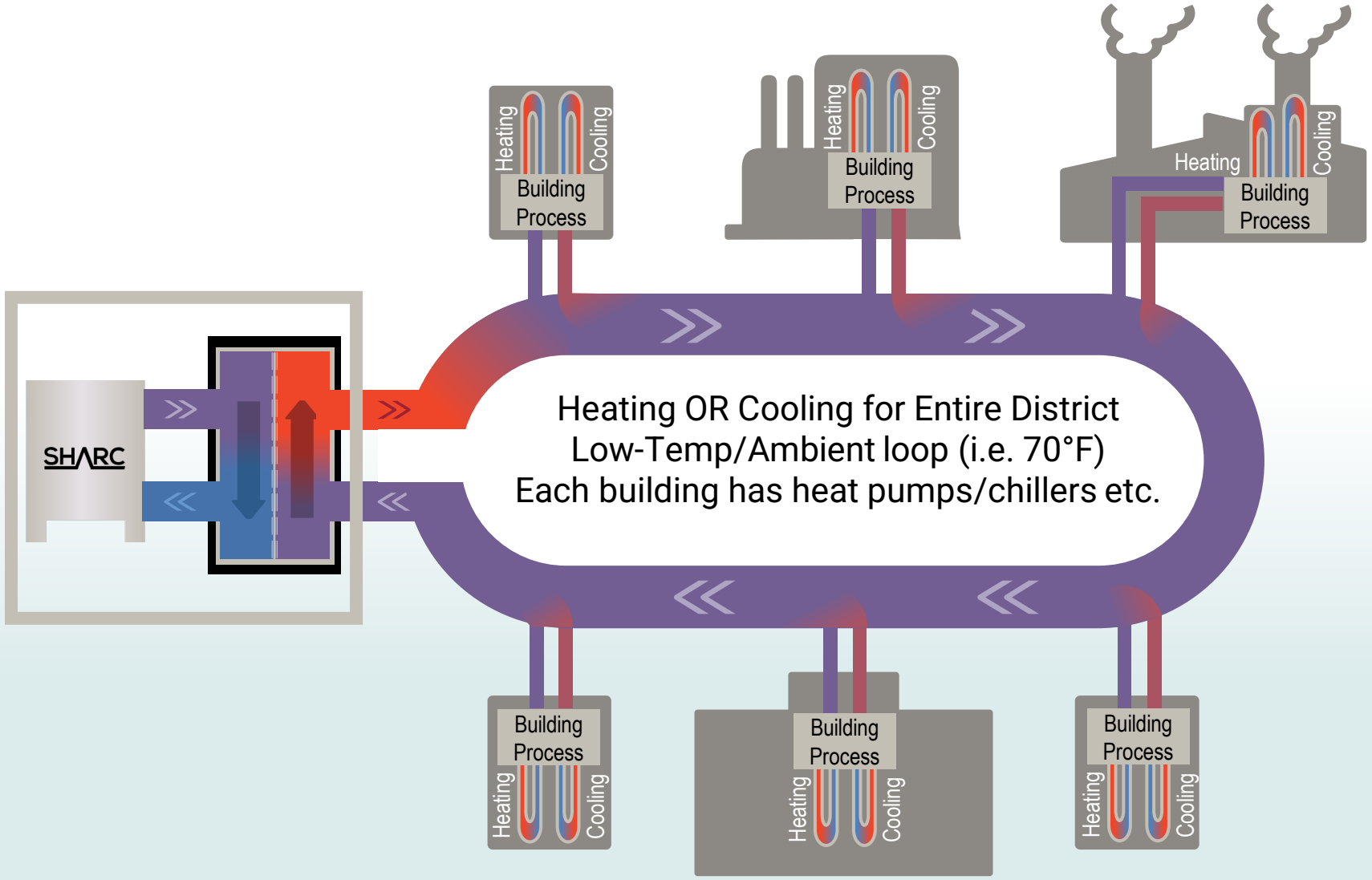
COMMERCIAL / MULT-FAMILY



- Hospitals & Hospitality
- Commercial Laundry
- Community Activity Centers
- 350+ Unit Apartments/Condos

The Solution

District Energy Example



SHARC project highlight

Ieləm' living

- 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

CUSTOMERS.sharcenergy.com

DC Water Headquarters

Washington, DC

SHARC

CASE STUDY

- Commissioned Summer 2018
- **SHARC 660 System**
- **250 Gallons Per Minute (GPM) flow**
- **Design heat transfer of 1.25 MMBH**
- **Estimated 30+ MMBtu/day transfer**
- Heat Demand – **3.3%**
  - Natural gas boiler offset – **est. 12.6 t eCO_2/year reduction**
- Cooling Demand – **96.7%**
- Cooling tower offset **est. 1.5M gallons of water saved annually** (evaporation & blowdown)
- Wastewater lift station sees 5M gallon per day average sanitary flow
- 150,000 ft^2 facility w/ 350 to 400 tons water-cooled HVAC (HPs / Chilled Beams / DOAS)
- LEED® Platinum

Cooling Tower offset saves the use of an estimated 1.5M gallons of fresh water annually

"I have never seen a technology that could have as positive of an impact on energy as what I have seen at the DC Water Headquarters"

- Congresswoman Marcy Kaptur, Chairwoman of the House Appropriations Subcommittee on Energy and Water Development

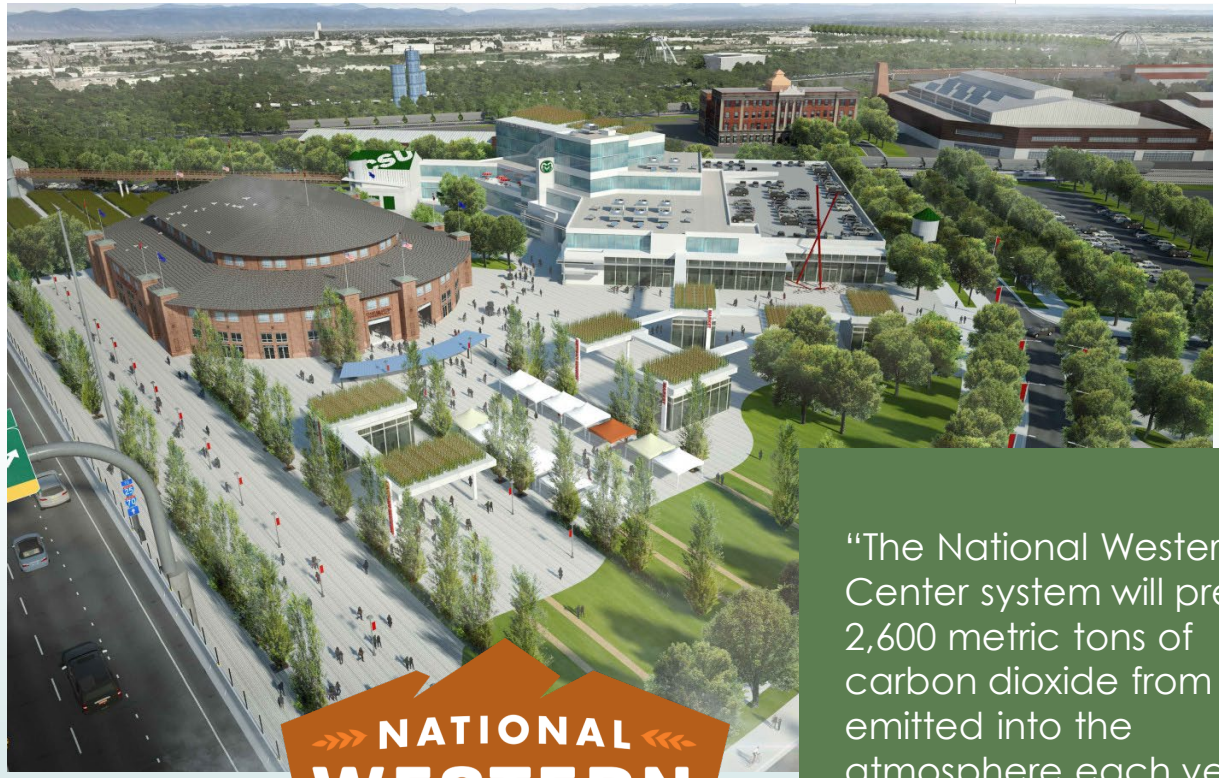
National Western Center

Denver, CO – Mixed Use Commercial Campus

SHARC

CASE STUDY

- **North America's largest District Energy wastewater recovery system (Apr 2022)**
- 3.8 MW district energy system
- Two SHARC 880 units, designed for up to 4.6MW
- Averages 3,000 GPM filtration of raw, untreated wastewater, used as source for onsite heat pump
- System provides 90% of total heating & cooling load for 1M sq ft of indoor space
- Hailed as showing leadership & commitment to Denver's Climate Action Plan
- Commissioned in January 2022
- **Reduction of 2,600 mt CO_2e/year by avoiding fossil fuels**



"The National Western Center system will prevent 2,600 metric tons of carbon dioxide from being emitted into the atmosphere each year by circumventing the need to burn fossil fuels."

THE DENVER POST

SYSTEM IMPACTS – National Western Center

CARBON REDUCTION

- 2,600 metric tons of CO_2 emissions each year avoided
- Equivalent to 6.6 million vehicle passenger miles driven annually

WATER SAVINGS

- 3,168,000 gallons of fresh water saved each year
- Equivalent to 5-Olympic sized swimming pools

SUSTAINABILITY

- Helps Metro Wastewater reduce effluent temperatures to protect the Platte River eco system.
- Aligns with Denver's Broader Climate Action Plan Goals

Southeast False Creek Neighbourhood Energy Utility

Vancouver, BC

SHARC

CASE STUDY

- Retrofit Project - Commissioned Spring 2017
- Uses waste thermal energy recovered from sewage to provide space heating and hot water to buildings in Southeast False Creek
- NEU currently serves 5 Million ft2 of residential, commercial, and institutional space, planned expansion to 20 Million ft2
- 3.2 MW plant capacity output, planned expansion to 8MW.
- 2-qty SHARC 880 units provide an average 1800 GPM filtration to the wastewater which is then used as a direct source for the heat pump
    - 9 MMBH heat recovery through existing Heat Pump

CITY OF VANCOUVER

Save the world, one liter at a time

SHARC ENERGY

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