Neighbourhood Energy Utility Heat Pump Warm sewage is screened and pumped The compressor runs to the heat pump. **Peaking boiler** on electricity. The heat Motor pump has a coefficient gas fired of performance (CoP) Sewage loop enters of 3.5. One unit of Back-up the heat pump at 25°C. electricity into the heat system pump results in 3.5 units of heat energy. Outgoing water temperature is 65°C To buildings Step Compression Conde ration Step Evapo nsation **Expansion** Step Cooled sewage is pumped to the Iona treatment plant. Return distribution From buildings system water (closed loop) returns to the NEU at 50°C. Return sewage returns

Step 1: Heat Absorption

to sewage pump station

at 20°C.

Refrigerant in the loop absorbs sewage heat causing it to vaporize into a gas.

Step 2: Compression

The refrigerant has expanded. It is then run through a compressor which increases the refrigerant pressure, making it into a hot gas.

Step 3: Heat Transfer

Thermal energy from the heat transfer loop is transferred to the NEU distribution system pipes.

As it cools, the refrigerant gas condenses into a liquid.

Step 4: Cycle Starts Again

The condensed refrigerant gas returns to a liquid form before it starts the heat absorption process again.

