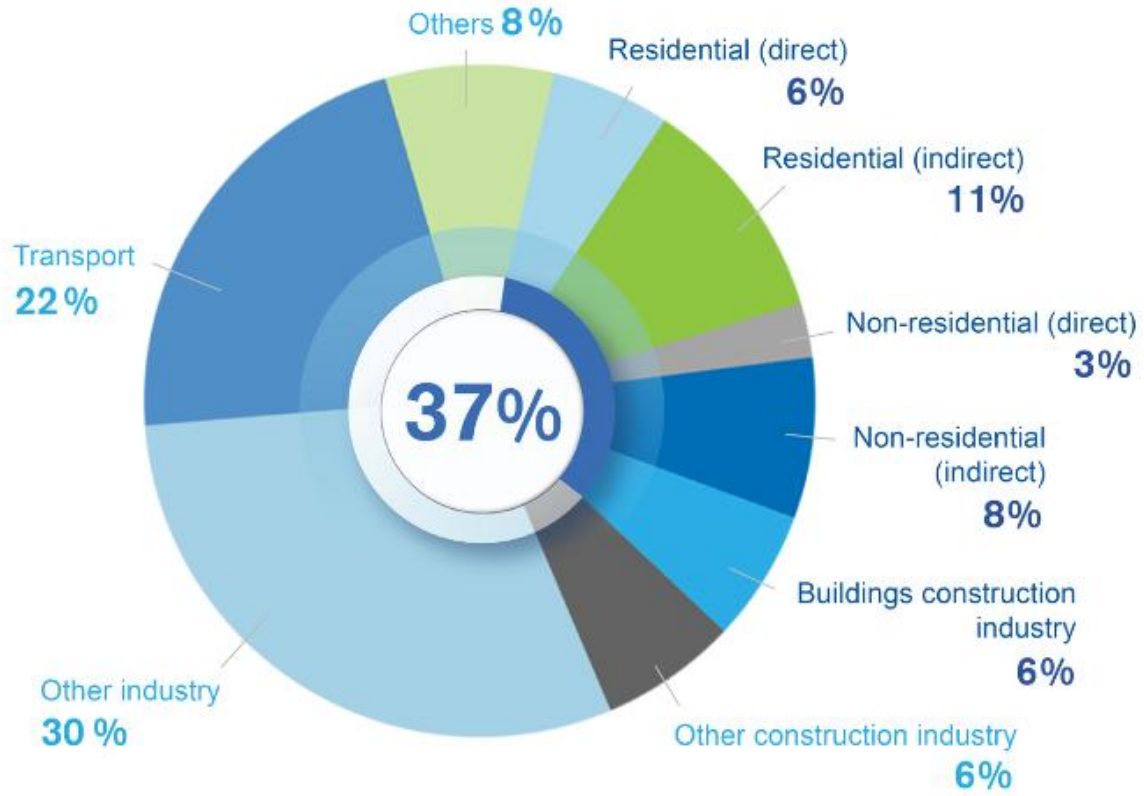
Dynamic Closed Loop: Drilling into Aquifer Geothermal Systems to Decarbonize

GLOBAL ENERGY AND PROCESS EMISSIONS



Based on data from IEA, Global energy and process emissions from buildings, including embodied emissions from new construction. 2021. IEA. Paris. https://www.iea.org/data-and-statistics/charts/global-energy-and-process-emissions-from-buildings-including-embodied-emissions-from-new-construction-2021, IEA. License: CC BY 4.0

LOW CARBON CENTRALIZED HEATING OPTIONS

Natural Gas
Boiler
COP: .7-.95

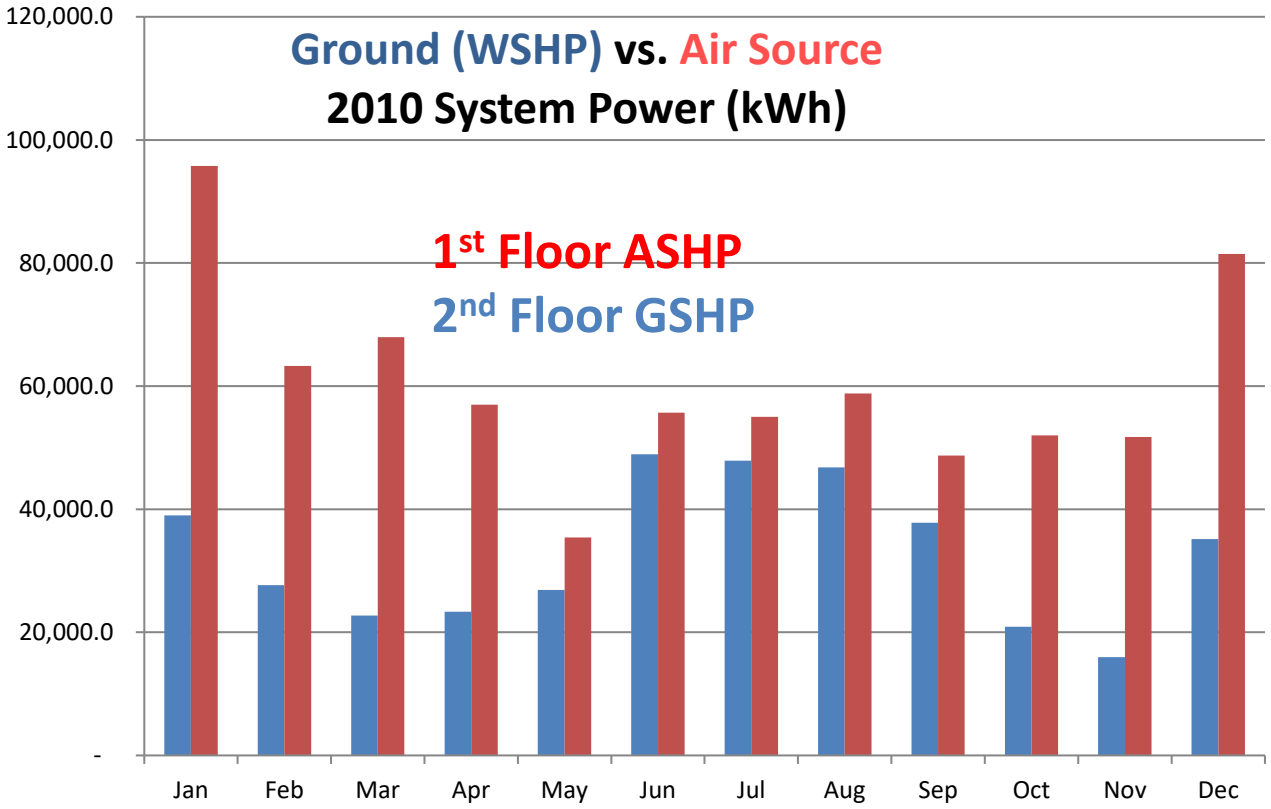
Electric
Boiler
COP: 1

Air Source
Heat Pump
COP: 2-4

Water Source
Heat Pump
COP: 2-7

INCREASED EFFICIENCY

Why Geothermal?

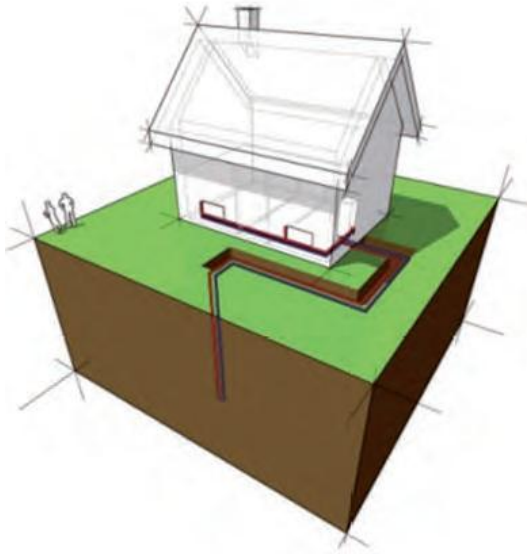


Power Consumption at ASHRAE Bldg, Atlanta

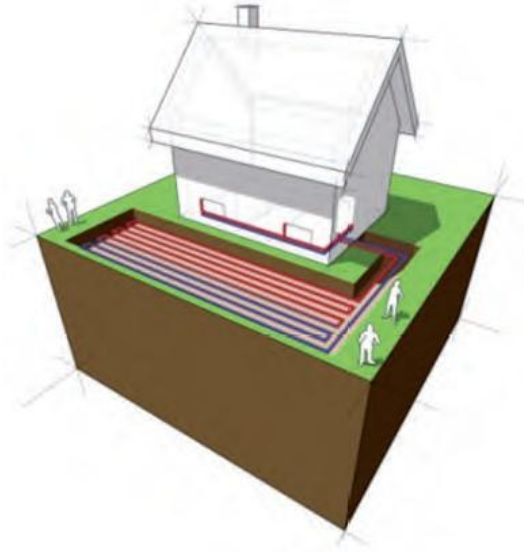
HVAC System Longevity & Resiliency - Decarbonization - Superior Comfort

High Efficiency Electrification - Net Zero Building Design - No Cooling Towers or Boilers

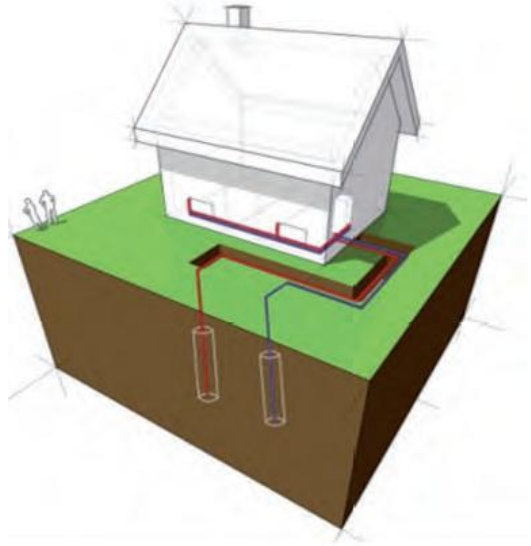
Traditional Types of Geothermal Systems



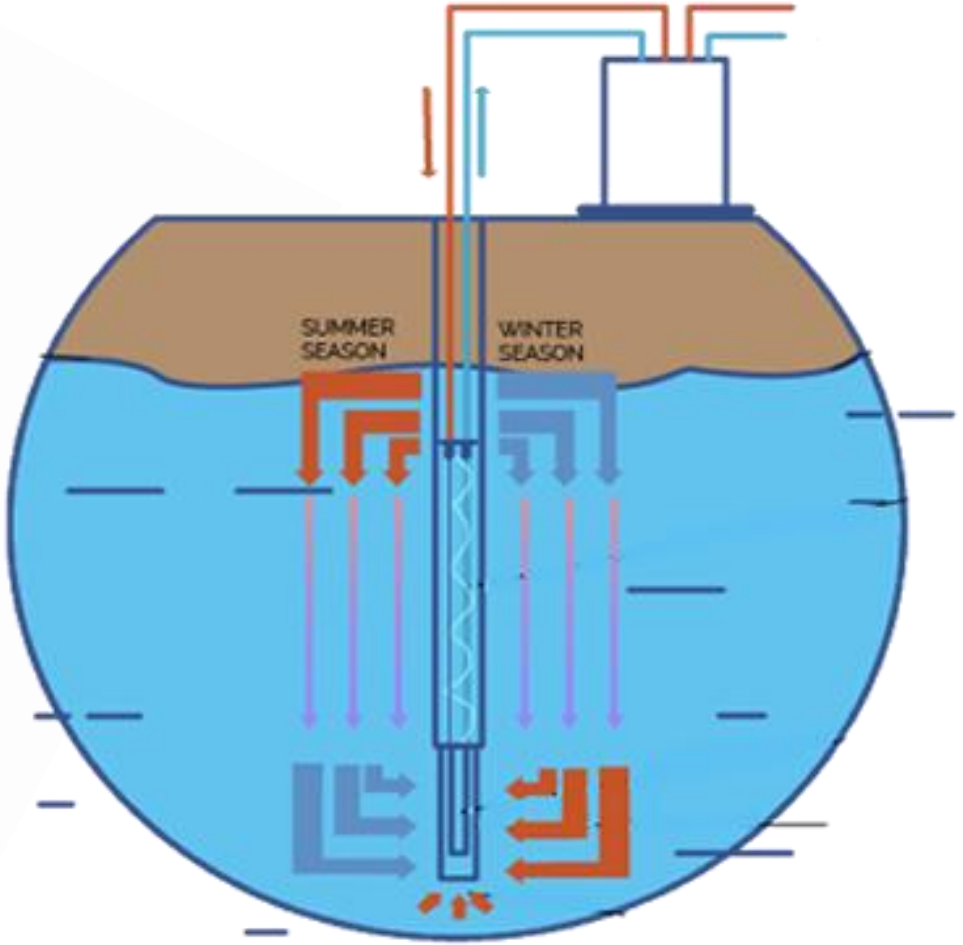
Vertical Closed-Loop



Horizontal Closed-Loop



Open-Loop

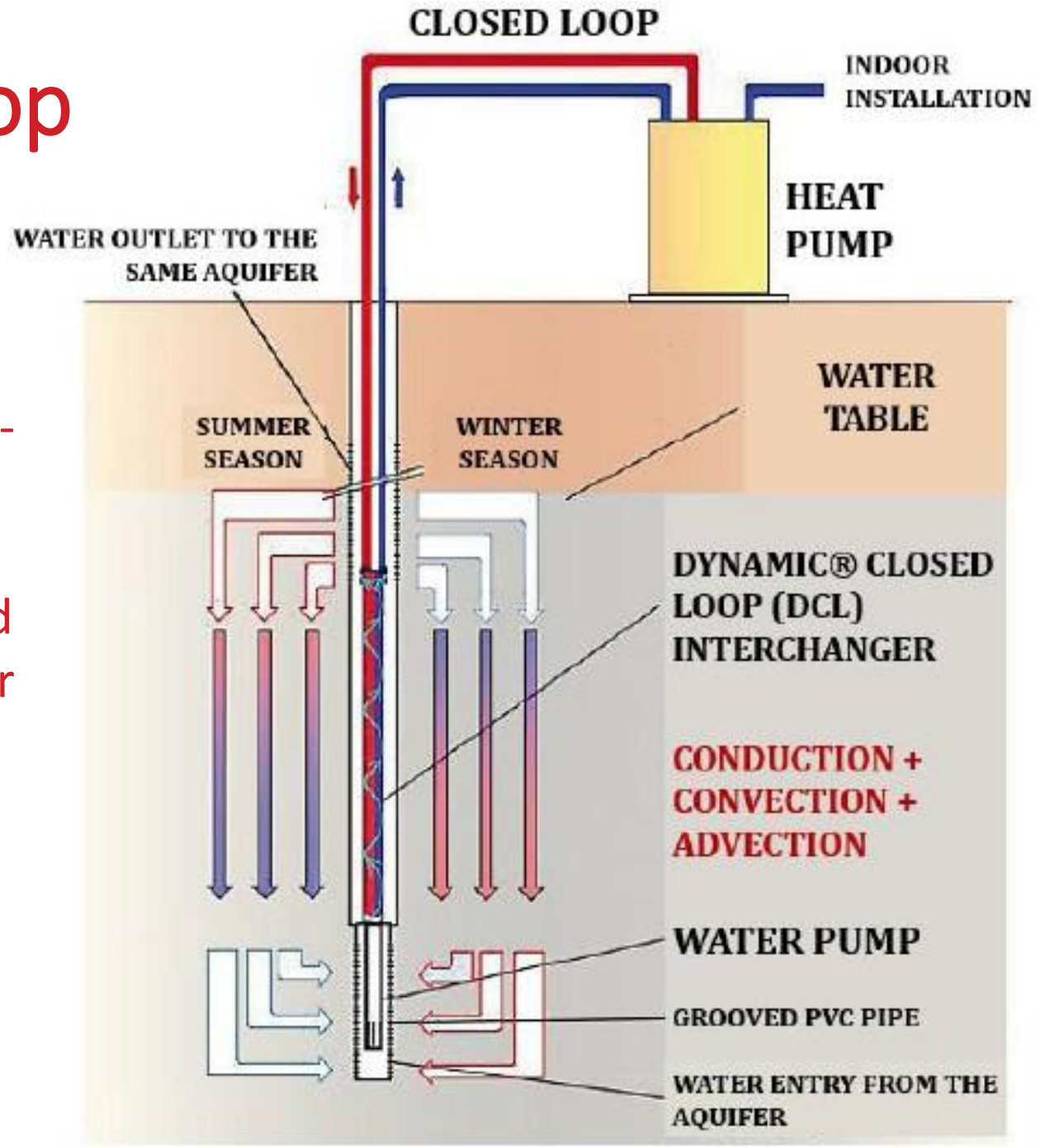


DCL Geoenergía S.L.

High Performance Geothermal Heat Exchangers

DCL- Dynamic Closed Loop

- Utilizes convection to multiply the energy transfer rate
  - -DCL Capacity: Up to ~150T per well
  - -Traditional closed loop system capacity: 1-3T per well
- In-well heat exchanger
  - -No need to extract water from the ground
  - -Lower flow rates require less pump power
- Advantages
  - -Efficient
  - -Renewable Energy
  - -Economic
  - -Ecological, Clean & Safe
  - -Accessible
  - -Esthetic



OVER 600 PROBE INSTALLATIONS WORLDWIDE

ARENAS

Polideportivo Nazaret

HOSPITALITY

Mindoro Hotel

MUSEUMS

The Principe Felipe Science Museum

MULTI FAMILY RESIDENTIAL

Apartment Building in Valencia

POOLS/SPAS

Provincial Olympic Pool

K-12

Elementary School in Zulichem

NSSD 112- RAVINIA ELEMENTARY

- Up to 40-50% Saved in Tax Credits and Incentives
- $3M in Total Project Savings ($6.67M project)
- Reduced the District’s Carbon Footprint by 30%
- Optimal Learning Environment