UBC OKANAGAN

Low Temperature District Energy System (LDES)

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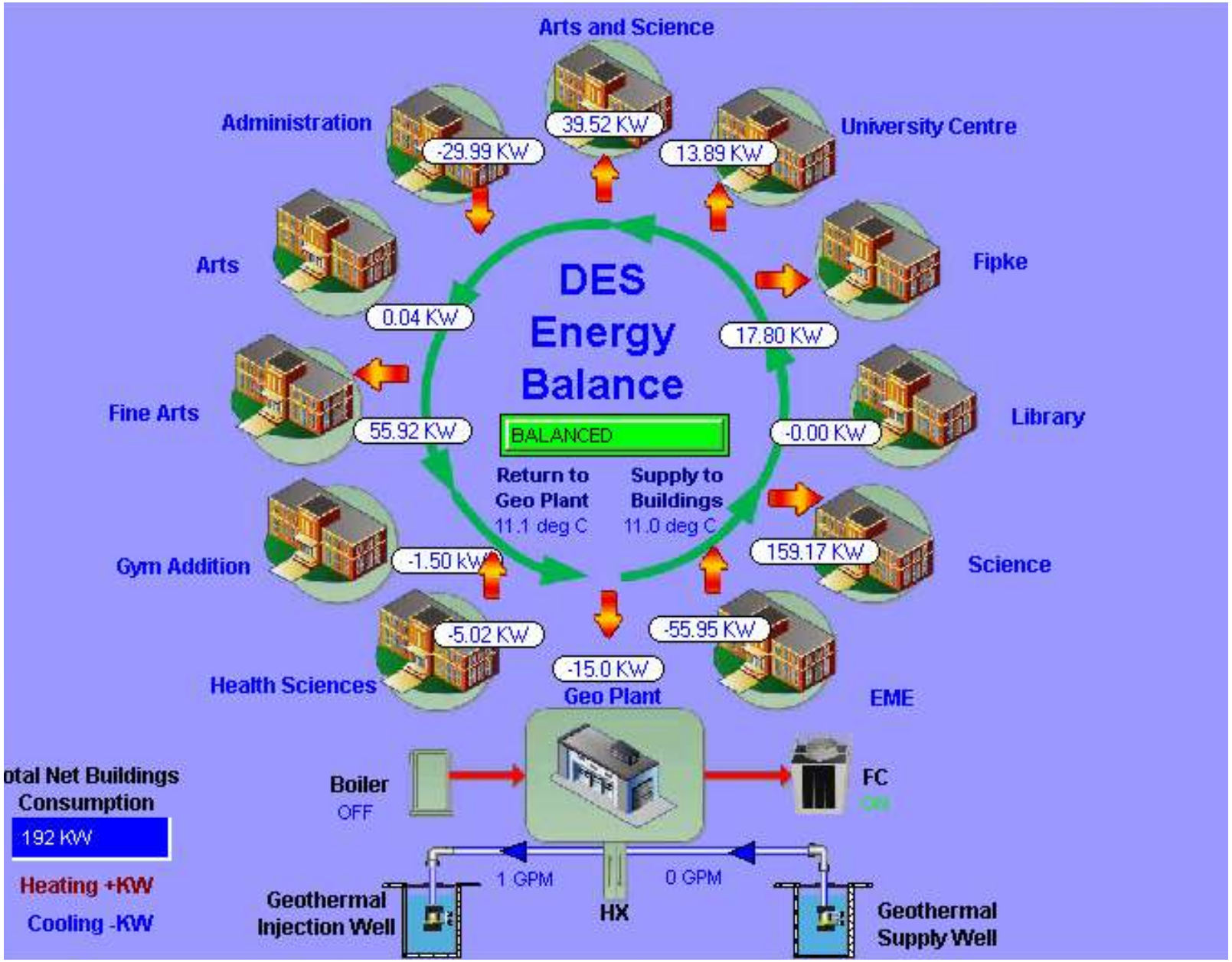
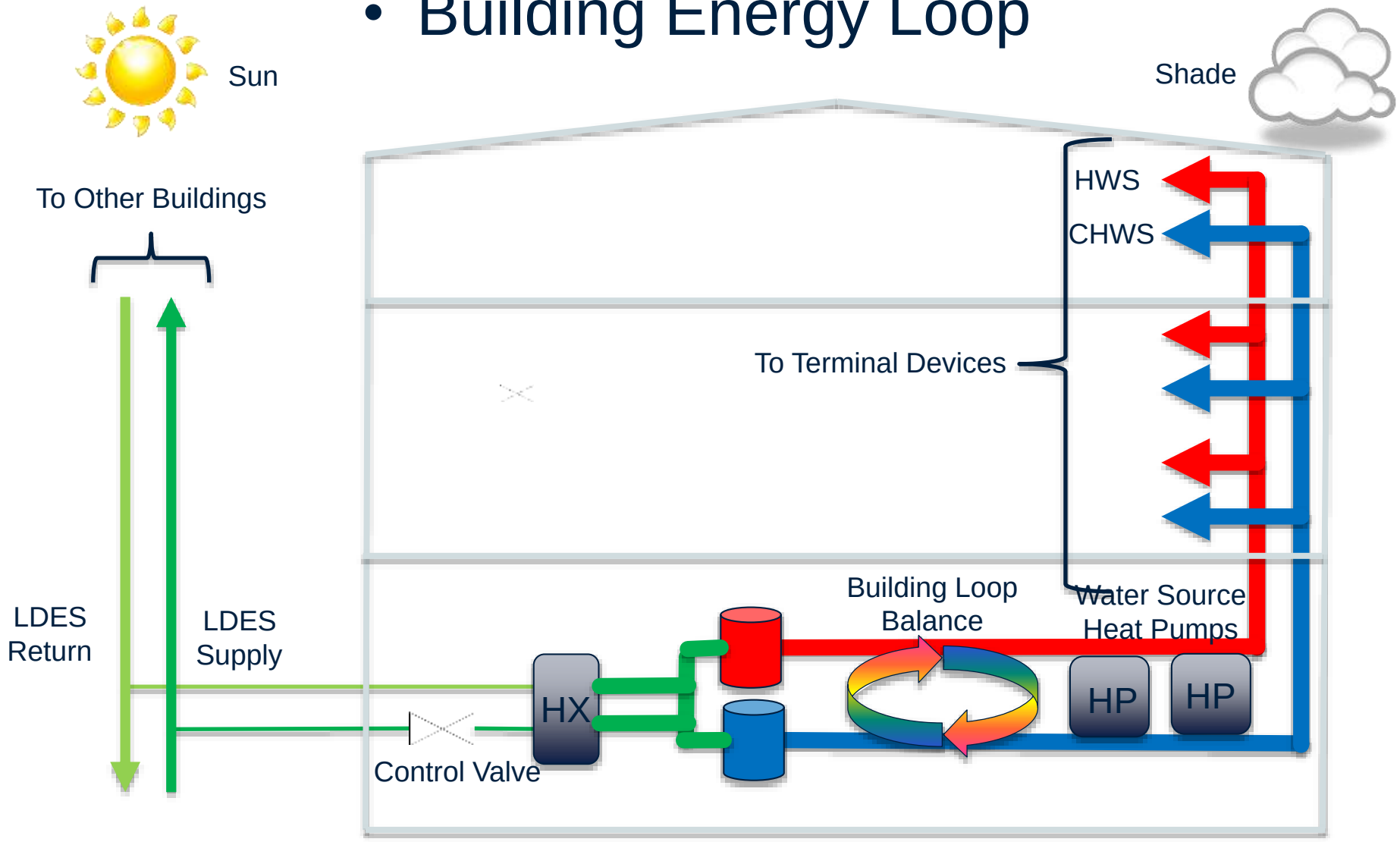
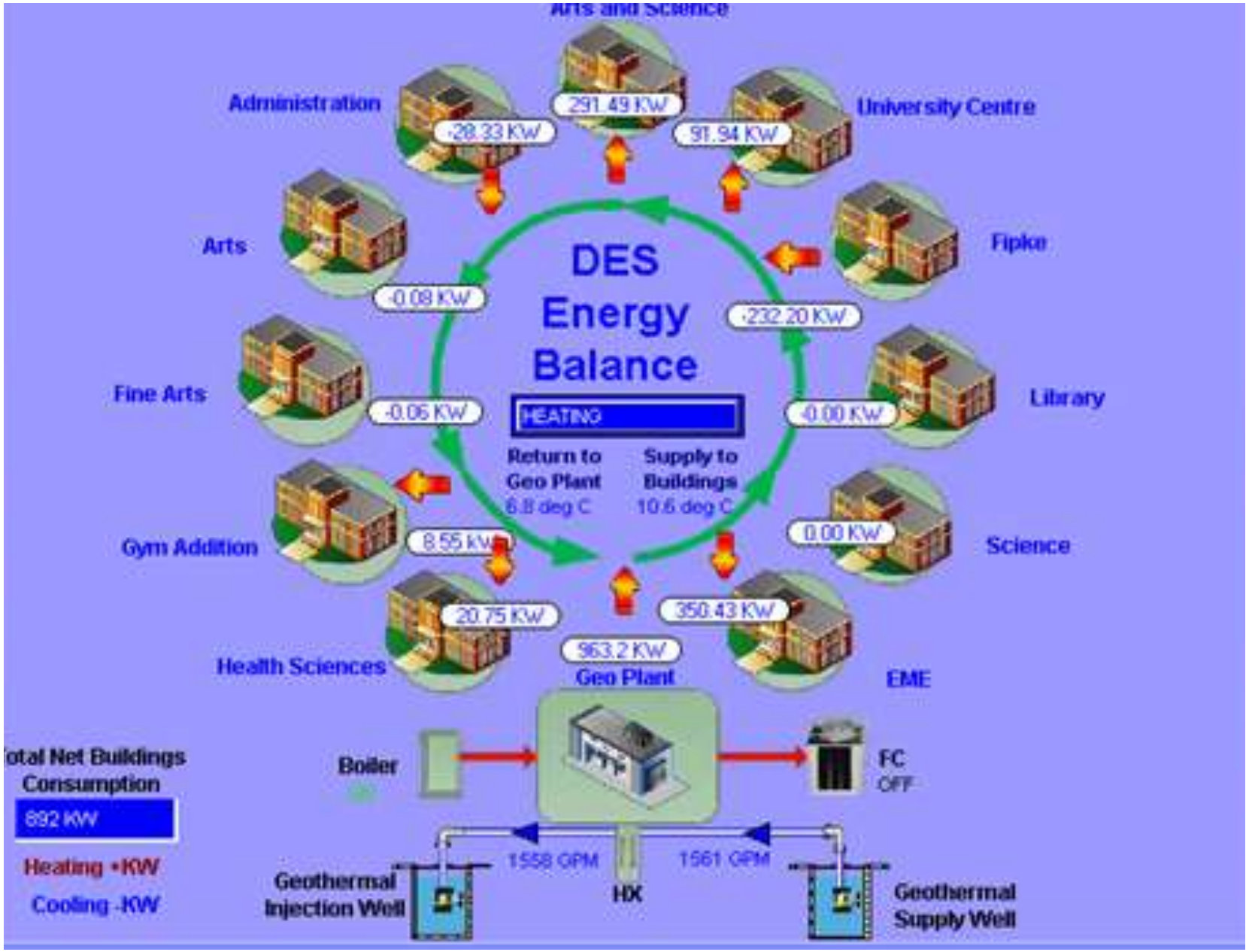
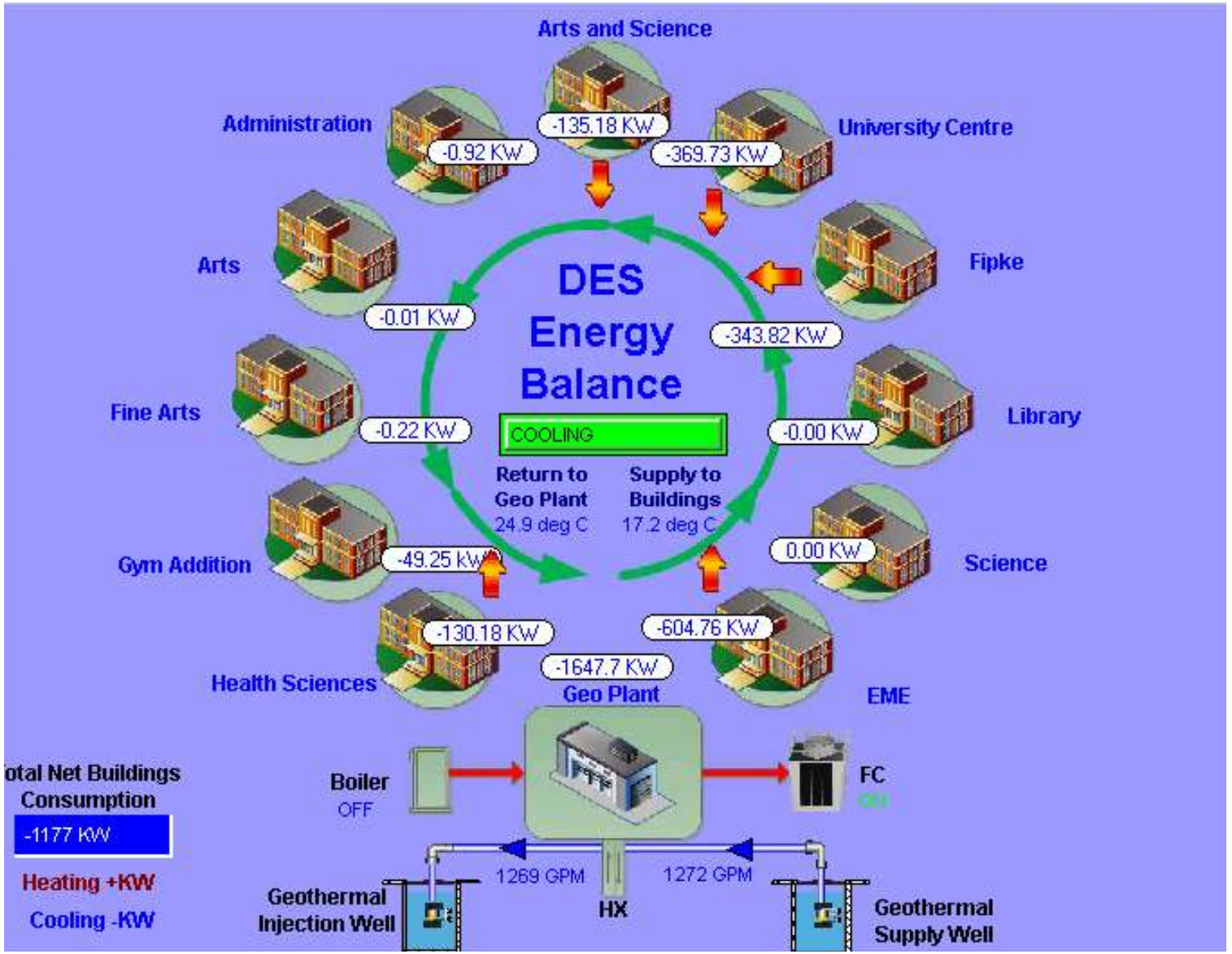

Arts and Science
39.52 KW
Administration
-29.99 KW
University Centre
13.89 KW
Arts
0.04 KW
Fipke
17.80 KW
DES
Energy
Balance
BALANCED
Fine Arts
55.92 KW
Library
-0.00 KW
Return to
Geo Plant
11.1 deg C
Supply to
Buildings
11.0 deg C
Gym Addition
-1.50 kW
159.17 KW
Science
-5.02 KW
-55.95 KW
-15.0 KW
Geo Plant
Health Sciences
EME
otal Net Buildings
Consumption
192 KW
Heating +KW
Cooling -KW
Boiler
OFF
FC
1 GPM
0 GPM
Geothermal
Injection Well
HX
Geothermal
Supply Well

LDES Operation Within a Building

- Building Energy Loop




Arts and Science
Administration
291.49 KW
-28.33 KW
91.94 KW
University Centre
Arts
-0.08 KW
Fipke
-232.20 KW
DES
Energy
Balance
HEATING
Fine Arts
-0.05 KW
-0.00 KW
Library
Return to
Geo Plant
6.8 deg C
Supply to
Buildings
10.6 deg C
Gym Addition
8.55 KW
0.00 KW
Science
20.75 KW
350.43 KW
963.2 KW
Geo Plant
Health Sciences
EME
otal Net Buildings
Consumption
892 KW
Heating +KW
Cooling -KW
Boiler
FC
OFF
1558 GPM
1561 GPM
HX
Geothermal
Injection Well
Geothermal
Supply Well


Arts and Science
-135.18 KW
Administration
-0.92 KW
University Centre
-369.73 KW
Arts
-0.01 KW
Fipke
-343.82 KW
DES
Energy
Balance
Fine Arts
-0.22 KW
COOLING
-0.00 KW
Library
Return to
Geo Plant
24.9 deg C
Supply to
Buildings
17.2 deg C
Gym Addition
-49.25 KW
0.00 KW
Science
-130.18 KW
-604.76 KW
-1647.7 KW
Geo Plant
Health Sciences
EME
otal Net Buildings
Consumption
-1177 KW
Heating +KW
Cooling -KW
Boiler
OFF
FC
1269 GPM
1272 GPM
HX
Geothermal
Injection Well
Geothermal
Supply Well

NEXT STEPS FOR UBCO

Connect all building loads to LDES

Ensure all building loads are connected to the building hydronic system and be able to be controlled/monitored from BMS. Eg. Back up cooling for data rooms need to be BMS controlled. Advantages are to remove heat at the building under peak loads/ smart grid/cooling towers.

For legacy buildings resize heating and cooling equipment to work with LDES building temperatures ongoing from now. Swap out end of life packaged systems to work off LDES systems eg. Replace chillers with WSHP and convert main plant to simultaneous heating and cooling.

When expanding LDES system ensure flow and pressure reduction strategies are employed. Eg. Create a DE loop. Eg. Create separate connected loops.

Consider new renewable heating and cooling sources and backup.

ADVANTAGES OF USING A LDES STRATEGY

Distribution Piping Thermal Losses are low

Simple Cheap Distribution

Dual Function - Heating and Cooling

Flexibility

Building Energy Sharing

District Energy Sharing

Can be Installed in less dense communities

CONSTRAINTS OF USING A LDES STRATEGY

Larger building heat transfer equipment.

Legacy buildings conversions.

Heat Pumps required in the buildings.

RESOURCES AND CONTACT INFORMATION

Geoexchange Web Page

http://facilities.ok.ubc.ca/geoexchange.html

Annual Energy Report

http://facilities.ok.ubc.ca/__shared/assets/1718annualreport58337.pdf

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