St-Julien, Geneva, Switzerland

This project concerns the replacement of an existing oil heating system by a HP only solution in a multifamily building. With the goal of having the total heat production from HP origin, two air/water heat pumps were implemented on the rooftop. One of the previous fuel oil boilers was kept for back up.

Key facts

Building

Location	*Geneva, Switzerland*
Construction	*1972*
Heated area	*4'049 m² living*
Level of insulation	*low (1972 standard)*

Heat pump

Heat source	*ambient air*
Number of HPs	2
Installed power	*2 x 125 kW (A-7/W65)*

Heating system

Operation mode	*HP only*
Existing oil boiler	*300 kW (back-up)*

Heat demand *ongoing monitoring*

Heating temperature	*65 °C (@ -7° ext)*
Heat distribution	*radiators*
Type of system	*centralized*
Max. temperature	*60 °C*
Circulation system	*yes*

Other information

Consumption	*ongoing monitoring*
Investments costs	*unknown*
PV installation	*no*

Lessons learned

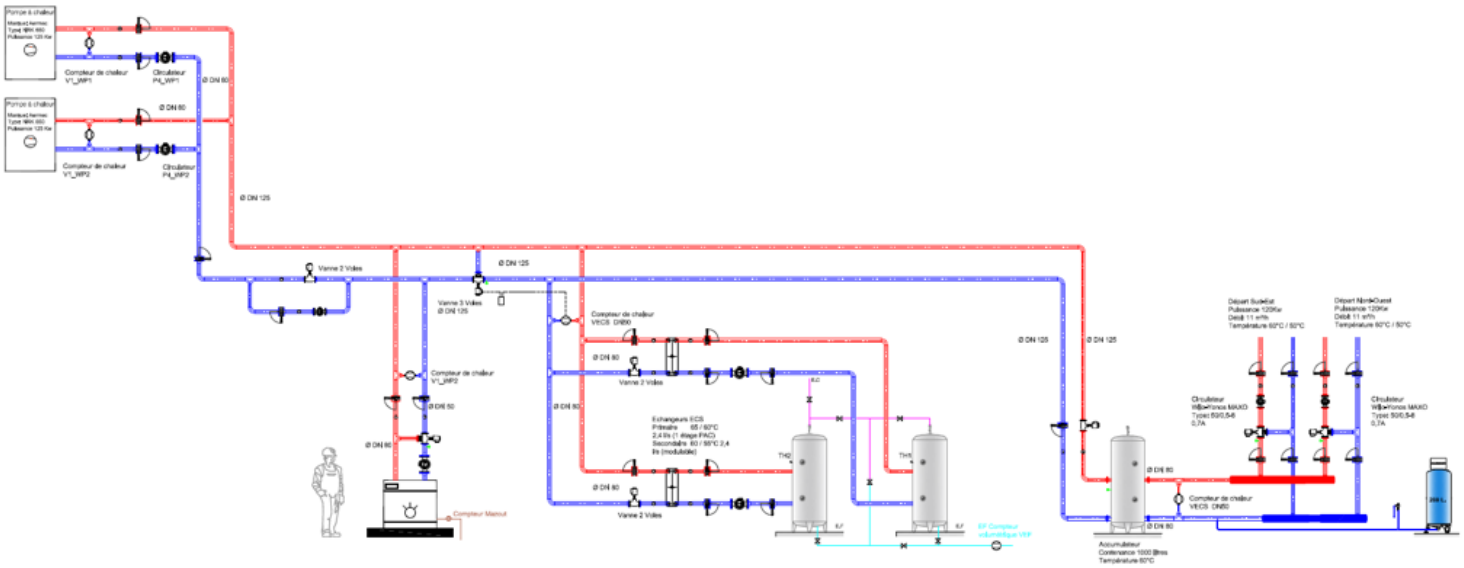
Ongoing monitoring, but so far:

- Major air HP constraints encountered: noise emissions, vibrations, safety... These implied important costs and planning work.
- Building's electrical connection had to be reinforced due to HPs massive absorbed power
- Adjustment of rooftop infrastructure, including insulation, in order to withstand the compression forces of larger HP chassis.

This existing MFH (multi-family building), built in 1972 in Geneva, contains 53 apartments over eight floors. It suffered no major envelope retrofit before this project and the total oil consumption amounted to 700 MWh/yr (for space heating and domestic hot water of its 4'049m² of heated area). *(Photo credit SIG, CSD Ingénieurs SA)*

St-Julien, Geneva, Switzerland, Technical Details

Hydraulic scheme of the system



Description of the technical concept

This project, part of a Geneva pilot program to replace fossil fuel boilers by heat pumps (HP) in MFH, concerns the replacement of a oil heating system by HP only heating system. For this purpose two 125 kW air/water heat pumps were implemented on the rooftop. As a back up, 300 kW oil boiler was maintained.
It should be mentioned that:

- The building rooftop was retrofitted before the HPs were installed. No other retrofit action was undertaken.
- The heat and DHW distribution system was not modified.

The two HPs work in turns, except when both are needed simultaneously. They provide the total heat for both space heating and domestic hot water.