**Daru, Geneva, Switzerland**

This project concerns the replacement of an existing gas heating system by a hybrid HP+gas solution in an existing multifamily building. With the goal of having the maximum annual heat production from HP origin, six air/water heat pumps were implemented on the rooftop. One of the previous gas boilers was kept for the peak loads in winter.

### Key facts

**Building**

- **Location**: Geneva, Switzerland
- **Construction**: 1992
- **Heated area**: 7'563 m²
- **Level of insulation**: low (1992 standard)

**Heat pump**

- **Heat source**: ambient air
- **Number of HPs**: 6
- **Installed power**: 6 x 30 kW HP (A2/W50)

**Heating system**

- **Operation mode**: hybrid (HP + gas)
- **Existing gas boiler**: 240 kW

**Heat demand**

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

**Other information**

- **Electricity cons.**: ongoing monitoring
- **Gas cons.**: 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.
- Hybrid HP+gas system: optimization of the gas boiler switching point is crucial for a good HP share in the overall heat production (specially with an old boiler without variable power output).
- The constraints of the old heat and DHW distribution system should not be underestimated.

The existing MFH (multi-family building), built in 1992 in Geneva, contains 68 apartments, within 4 floors, plus commercial establishments on the ground floor (restaurant, bakery, ...). It suffered no major envelope retrofit before this project and the total gas consumption amounted to 1’000 MWh/yr (for space heating and domestic hot water of 7’563m²). (Photo credit SIG, CSD Ingénieurs SA)
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 gas heating system by a hybrid HP+gas heating system. With the goal of having a maximum heat production from HP origin, six 30 kW air/water heat pumps were implemented on the rooftop. For the peak loads in winter, a 240 kW gas 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 6 HPs are divided into 2 groups of 3. 1 group exclusively for space heating, the other can either do space heating or domestic hot water. The gas boiler, when functioning, can work simultaneously with the HPs.