

NEIGHBORHOOD “HINTERE AUMATT”, HINTERKAPPELEN  
(BERN) - SWITZERLAND

## Wohnsiedlung “Hintere Aumatt”, Hinterkappelen (Bern)



Fig 1: View from the river Aare on the neighborhood Hintere Aumatt.

## Summary of the project

Since 1980, a total of 187 residential units and 57 studios have been built in five stages. In 1994, the residential complex Hintere Aumatt in Hinterkappelen near Bern has been completed. A gas engine heat pump, using the river Aare as a heat source, was installed at that time. At the end of its life cycle, the machine was replaced by two electric driven heat pumps using ammonia, for ecological reasons.

” AMBIANT HEAT FROM THE RIVER  
AARE AND HEAT PUMPS FOR  
HEATING 187 RESIDENTIAL APART-  
MENTS ”

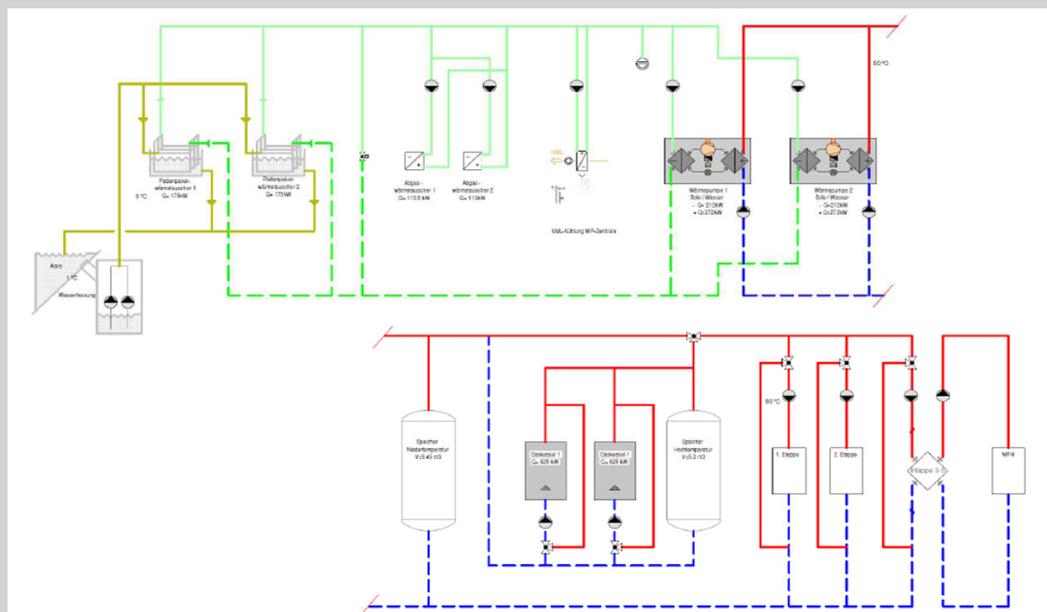


Fig 2: Heating diagram of the plant in Hintere Aumatt.



## Detailed summary of the project

### 1. Replacement of heat generation unit

The heating plant Hintere Aumatt had reached the end of its operational life time, whereupon a bidding process for contracting was launched. Energie Wasser Bern (ewb) was commissioned with the refurbishment of the plant to ensure an efficient heat supply of the residential development for the upcoming years. In autumn 2011, the detailed planning started and the construction work began at the end of April 2012. The old concept was based on a gas engine powered heat pump to cover the base load and gas and oil heating boilers to cover the peak loads. At first the dismantling of the old infrastructure, including gas engine, heat exchangers and the superfluous oil tank was carried out. After minor constructional modifications, the new equipment has been installed.

### 2. Ambient heat from the River Aare

Two electrically driven heat pumps have been installed, which use the Aare as an ambient heat source. The surface water utilization has now been increased to the maximum permitted amount of 75 m<sup>3</sup>/h (previously 50 m<sup>3</sup>/h). The heat pumps are used to cover the base-load demand and are therefore primarily operated up to an outside temperature of approx. 7.5 °C. Two gas boilers are installed as additional heat generators to cover peak loads. If outside temperature drops and the heat demand of the residential development increases, the gas boilers are operated in series with the heat pumps. The annual coefficient of performance reaches in the average 3.9 without pumping energy and 3.5 including pumping energy.

### 3. High energy efficiency by residual heat recovery from exhaust gases and space heating

The residual heat from natural gas combustion in the exhaust gas, as well as the waste heat from the compressors are recovered and transferred to the heat pump cycle. The exhaust gas temperatures of the gas boilers can be lowered from 145 °C to 17 °C, making very efficient use of the primary energy.

## FACTS ABOUT THIS PROJECT

**Building type:** 187 apartments and 57 workshop space

**Heated floor area [m<sup>2</sup>]:** unknown

**Installed heat capacity [kW]:** 2 x 260 kW (heat pumps), 2 x 550 kW (gas burner)

**Heating demand:** 2 750 MWh/a

**Heat source:** Ambient heat from the river and heat pumps, natural gas (for peak loads)

**Investment cost:** 1 500 000 CHF

**Participating countries:** Switzerland

**Time frame:** between Construction from 1980 until 1994, heating system refurbished in 2013

**Project organisation:**

**Project leader:** Energie Wasser Bern

**Project partners:**

- Building owner: MEG Aumatt
- Energy contracting: Energie Wasser Bern
- Planner: Eicher und Pauli AB

**Link to web page or report:**

<https://www.aumatt.ch/wp/home/siedlung-aumatt/>  
(in German)

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**IEA Technology Collaboration Programme on  
Heat Pumping Technologies (HPT TCP)**