

## Local project in Breda - HOLLAND



- Built in the 1950's
- Functional design by Peutz
- Apartment blocks
- WonenBreburch: subplans F1 and F2
- Preservation of Peutz' urban plan
- Apartments and single family dwellings
- Low energy performance label F/G



**Heuvel refurbishment project** in Breda Municipality comprises a residential area built in 1945 – 1960 with a great variety of housing blocks and local facilities. Total about 3200 dwellings with 8000 habitants.

2500 dwellings are owned by housing associations WonenBreburch and Laurentius – and 700 are private owned. Energy supply is from gas and electricity.

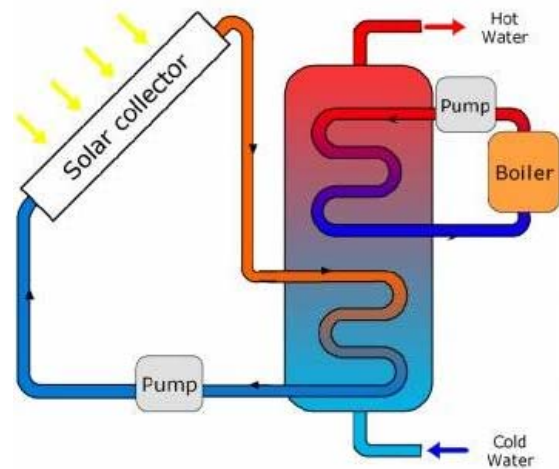
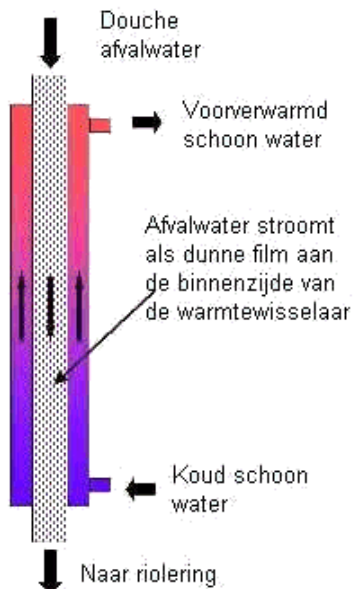
Restructuring process 2005 – 2015 will comprise demolishing of 650 houses and renovation of 650 houses – besides new built houses for total 950 dwellings. Also a new retail centre, a new school and an old monumental church changed into a multifunctional centre.

## Energy-options for analysis

- Reference: EPC = 0,80; natural gas-infrastructure
- Variant 1 a & b: Energy saving or solar thermal collectors
- Variant 2 a & b: Geothermal heat pump (heat-infrastructure)
- Variant 3 a & b: variant 2 + demand-controlled natural ventilation (CO<sub>2</sub>-concentration)
- Variant 4 a & b: variant 3 + renewable electricity production (pv + possibly urban wind turbines)

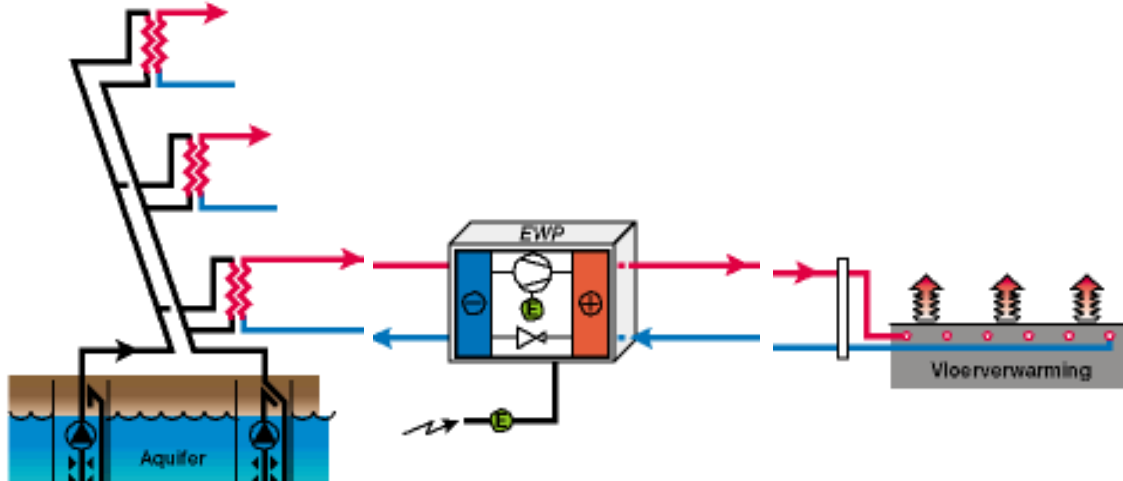
### Variant 1 a & b: Energy saving or solar thermal collectors

- Better thermal insulation
- More efficient natural ventilation
- Variant 1a: Shower-drain heat-recovery
- Variant 1b: Solar thermal collector for domestic hot water



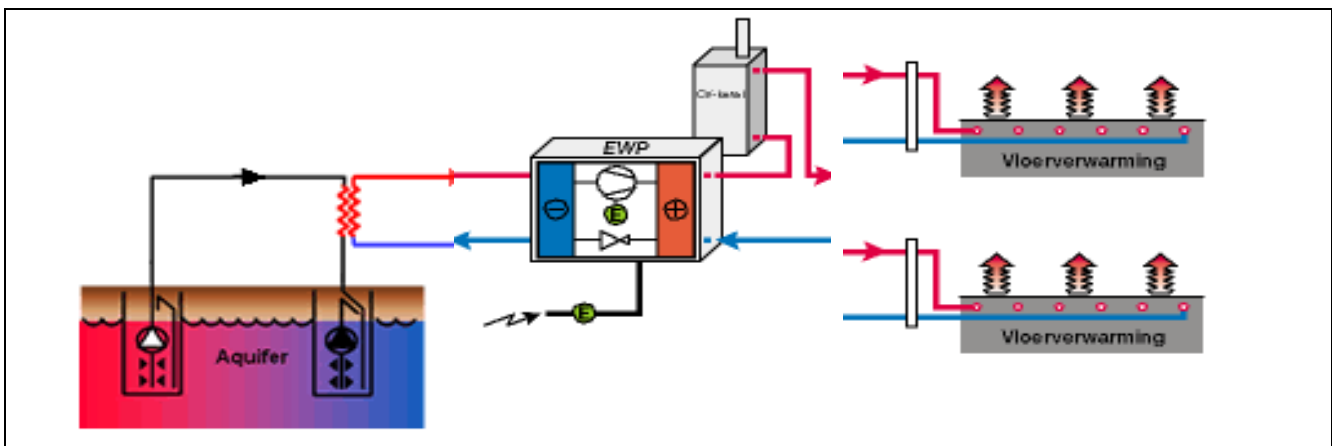
### Variant 2 a: Geothermal heat pump (heat-infrastructure)

- Collective groundwater source
- Individual heat pump per residence for domestic heating, hot water and cooling



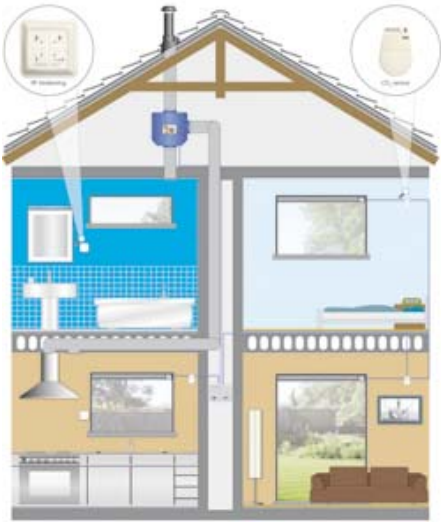
### Variant 2 b: Geothermal heat pump (heat-infrastructure)

- Collective geothermal heat pump
- Heating and cooling infrastructure



### Variant 3 and 4: Demand-controlled natural ventilation + possible PV

- Variants 3 a&b: 2 a&b + Demand-driven natural ventilation (CO<sub>2</sub>-concentration)
- Variants 4 a&b: 3 a&b + Solar panels for renewable electricity



### Reference projects to compare with:

- Efficient natural-gas fired condensing boiler for domestic heating and hot water
- Efficient natural ventilation
- Low-temperature underfloor heating
- Good thermal insulation



## **Energy commitment**

The municipality Breda and housing association WonenBredburg and neighbourhood council "Heuvelbelang" have signed an energy covenant – committing to reach 45% CO2 reduction in retrofitting/refurbishment operations before 2015.

The process of energy and urban planning is relatively new for restructuring areas in The Netherlands – most of the experiences are in new urban plans.

ENPIRE project has a considerable replication potential in 27.000 dwellings of WonenBredburg as example for other social housing companies in Breda.

WonenBredburg can utilize the sustainable energy building processes to develop a new and better rent contract combined with a contract for heat/cooling and warmwater supply – so that investments in installations will be paid back on long term – and so that housing association as well as tenants pays for the improvement and sustainable energy system / CO2 reduction.

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