



ATES SYSTEM

ENERGY EFFICIENT COOLING OR HEATING

COOLING OF PIG FARMS

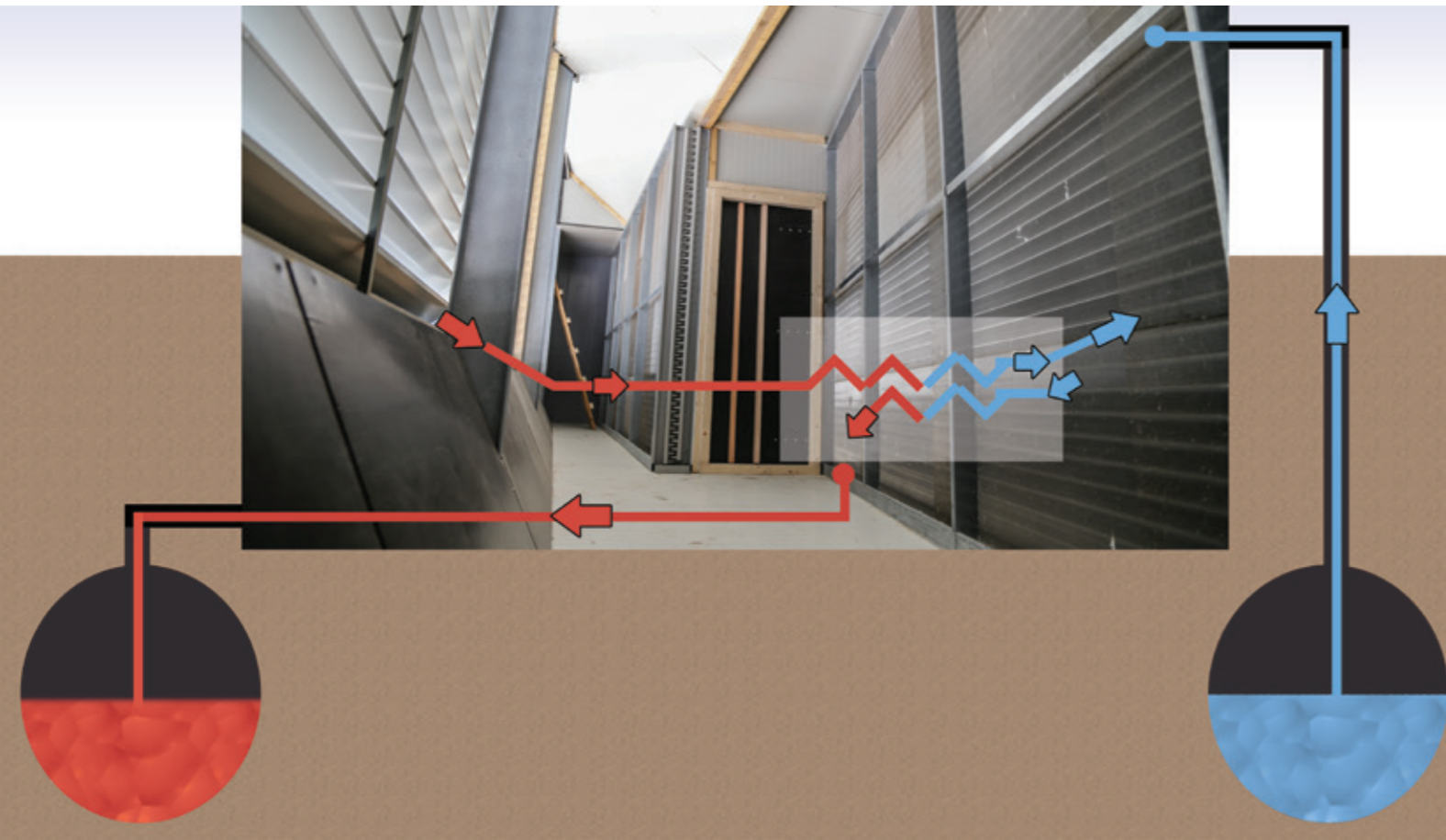
In both fattening pig farms and sow farms, it is necessary that the temperature in the departments does not become too high during the summer period. This applies in particular to heavier fattening pigs, sows in group housing, lactating sows and sows in the mating shed. Research has shown that the optimal house temperature for (medium) heavy fattening pigs is lower than 19 degrees Celsius, the temperature should in any case not exceed 24 degrees Celsius. If the temperature in the department rises in the summer to, for example, 30 degrees Celsius, an average fattening pig consumes 0.4 kg less food per day. The optimal temperature for a lactating sow is 21 degrees Celsius or lower. A higher temperature can have negative consequences for the next litter.



GENUGTEN AGRI PROJECTS B.V. IS A SPECIALIZED COMPANY THAT CAN CALCULATE AND DESIGN AN ATES SYTEM SPECIFICALLY FOR THE CONSTRUCTION OF YOUR STABLE.

HOW DOES THE ATES SYSTEM WORK

With an aquifer thermal energy storage (ATES) system, two water sources are drilled on the site, which are located at a sufficient distance (minimum 50 m) apart. In the summer, the groundwater is pumped from one source, via the cooling-heat- blocks to the other source where the water is injected back into the ground. With the cold water, the incoming air is efficiently cooled down, as a result the temperature of the return water rises.

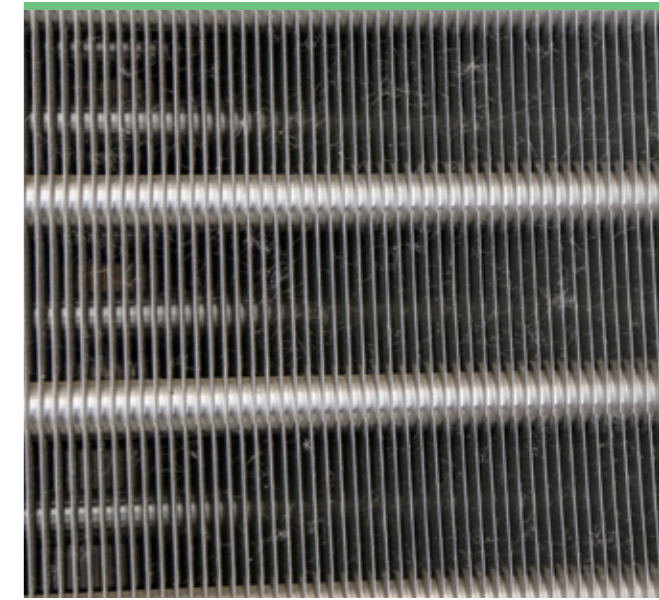


The groundwater temperature in the hot water source rises to approx. 12°C in the summer. In the winter this water is used to warm up the incoming air. If the outside temperature is -20°C, the incoming air will still have a temperature of +7°C because of the ATES System. By heating the incoming air in the winter, the water in the system is cooled down. The temperature of the groundwater of the cool water source lowers to approx. 8°C. This water is then being used to cool down the incoming air in the summer.

This system is the most efficient, effective but also most expensive cooling and heating system and is cost-effective with at least 3.000 fattening pigs or 600 sows. With the ATES System 1 Kwh of electrical costs for the waterpump, a maximum of 100 Kwh can be cooled, an amazing rate of return. Furthermore, the ventilation capacity can be halved with the ATES system. As a result, the costs of the air washer and the operating costs for the ventilation and air washer can be halved.

In practice, these savings account for half of the total investment costs. By combining the ATES system with a ventilation ceiling, the investments costs can be lowered even further. Ultimately this results in a total of savings that represent a large part of the investment costs. The investment is just a little more than a stable with earth canals.

In comparison to systems in which the cooling is done by evaporating water, the ATES system lowers the relative air humidity in the farm and therefore lowers the physiological temperature for the pigs even further. A big advantage is that heating can also be done with the ATES System. The incoming air never gets colder than 7°C which has a very favorable effect on the barn climate in the winter.



THE INVESTMENT COSTS ARE APPROX. 25,00 - 30,00 EUR PER FATTENING PIG AND 135,00 - 150,00 EUR PER SOW.



EXAMPLE STABLE WITH 4560 FATTENING PIGS

Saved m3 natural gas according to calculations:	80.000 m ³ /year
Saved CO2 emission according to calculations:	90 tons/year
Maximal ground water abstraction/injection:	291.300 m ³ /year
Maximum ventilation:	242.400 m ³ /year
Cooling capacity at 35°C:	1.093 Kwh
Heating capacity at -18°C:	463 Kwh
Cooling outdoor air from 35°C to:	27,5°C
Heating outdoor air from -18°C to:	8°C
Sources:	2 pieces, depth 48m
Pump capacity:	90m ³ /hour



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