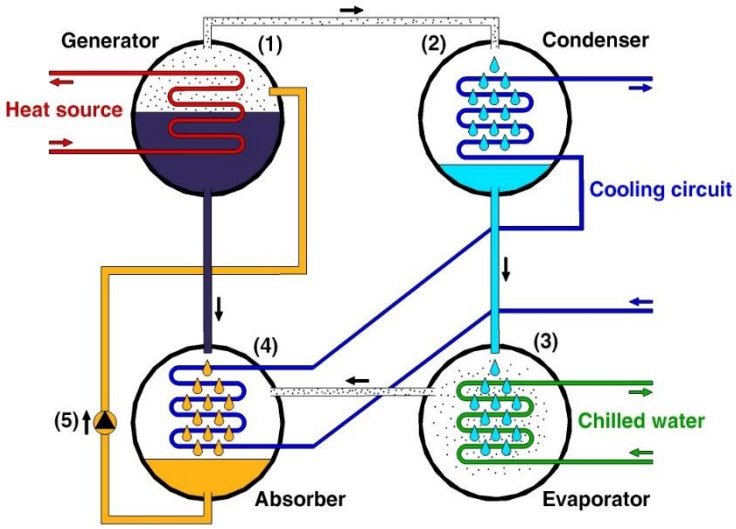
Cooling from waste heat: using heat as a driving energy



The cooling process in an absorption unit involves two different fluids: a refrigerant and an absorbent. For an absorption unit running with a water diluted solution of lithium bromide (LiBr), the water is the refrigerant and lithium bromide the absorbent.

In the generator, the water diluted solution of lithium bromide is heated up to its ebullition point. Thus, the water is vaporized (1) and goes into the condenser. On the other side the concentration of lithium bromide increases.

In the condenser, due to the cooling water circuit, the water vapor condenses (2). The obtained liquid water is sent to the evaporator.

Because the pressure in the evaporator is below 50 mbar, the water vaporizes again at a really low temperature (3). This process deducts thermal energy to the chilled water circuit, which leads to a temperature decrease.

The resulting water vapor goes to the absorber where it meets the concentrated solution of lithium bromide. The water vapor returns to a liquid state when it is absorbed by the lithium bromide solution (4). This exothermic reaction (the absorption process) releases heat which is evacuated by the cooling water circuit.

The obtained solution is pumped back to the generator to begin a new cycle (5).