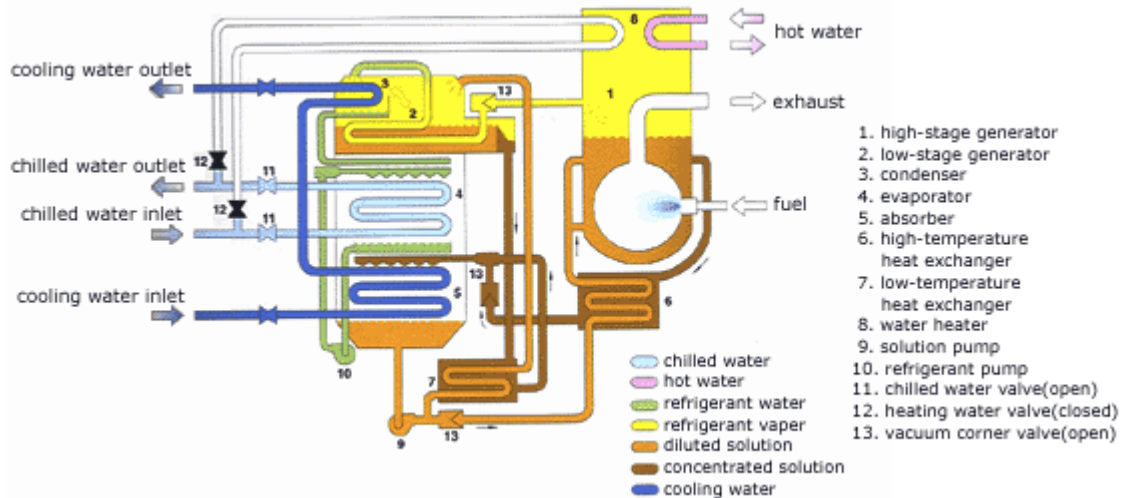


## The Science of Absorption

**The Absorption Cycle** uses a condenser and evaporator just like its vapor compression counterparts, but replaces a large motor and compressor with a thermal fluid compressor (absorber, generator, and small fluid pump) to transfer low temperature energy to high temperature heat rejection. Using thermal energy and not electricity, to create chilled water permits the simultaneous production of chilled water and hot water.



**Cooling Cycle** begins in the evaporator (4) where the refrigerant (water) is sprayed over tubes containing chilling water that is circulated through the building. The evaporator operates under a vacuum that permits the refrigerant to boil at a low temperature and remove heat from the cooling water.

The refrigerant vapor migrates to the absorber (5) where it is compressed by being absorbed into a concentrated solution of lithium bromide (LiBr). The combined LiBr/water solution is pumped (9) to the high stage generator (1) and low stage generator (2) in parallel where heat is added to vaporize the refrigerant from the absorbent.

The concentrated LiBr returns through intermediate heat exchangers (6 & 7) improving cycle efficiency to the absorber and the refrigerant enters the condenser (3) where it is liquefied. The liquid refrigerant returns to the lower pressure evaporator (4) to repeat the process.

**Heating Cycle** can operate simultaneously during the chiller operation, or hot water can be produced independently using the high stage generator (HSG) (1) as a very efficient vacuum boiler. The solution in HSG boils to produce a high temperature vapor that enters the heat exchanger (8) where it is condensed on the heating tubes transferring heat energy to the hot water loop.