

Alternative2Energy



Light on energy



Light on the planet



High on efficiency



Kingspan[®]

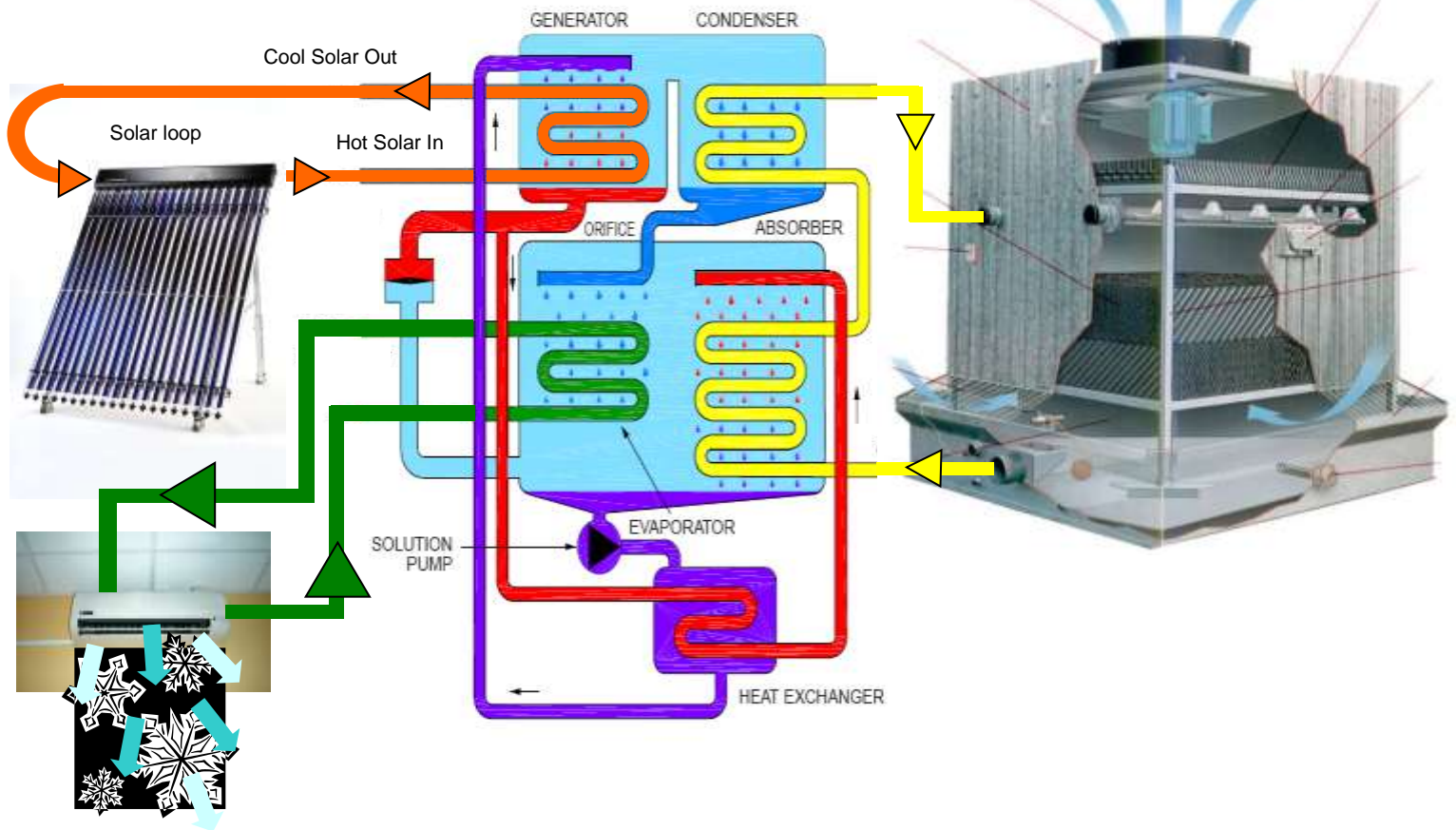
Why Solar Cooling?



- Proven technology – the principle of absorption cooling has been known since the 1700s
- Strong correlation between demand for energy (cooling) and availability of energy (solar radiation)
- Uses 60-80% less electricity than conventional
- More environmentally friendly refrigerants
- Quieter operation



How it works



Why Solar Cooling in the Gulf states?



- Perfect climate – high solar radiation with relatively low humidity
- Cooling consumes the highest energy in the Gulf (estimated at up to 80% of electricity demand)
- A lot of new construction activity (as opposed to retro-fit)



- 6,000m² warehouse and office facility built for ESAB
- Environmentally-friendly building design, minimising energy and water usage
- Solar panels generate hot water; this energy is used to create cold water in the ClimateWell Units
- This cold water – topped up, as required, from a conventional chiller – is fed to air-handling units, creating cold air
- The cold air is then fed through the hollow-core slabs in the building structure, thus cooling the building interior



- Building area 2,000m²
- 6 Climatewell chillers
- 150m² Thermomax DF100 evacuated tubes from Kingspan
- Wet Cooling Tower
- Climatedeck distribution system



Case Study in Dubai



Case Study in Dubai



Disadvantages of Solar Cooling



- High Water demand increases the cost of the system, especially where water is already scarce, as in the Gulf states
- System costs are much higher compared to conventional cooling systems, making the paybacks very difficult to justify
- Energy costs in the Gulf states are generally very low, reducing the real savings in energy cost, compared to other, e.g. European, locations
- Much better solution is to use the reject heat for process heat, therefore eliminating or at least reducing the need for a cooling tower – this will vastly reduce the water usage and therefore reduce the running costs



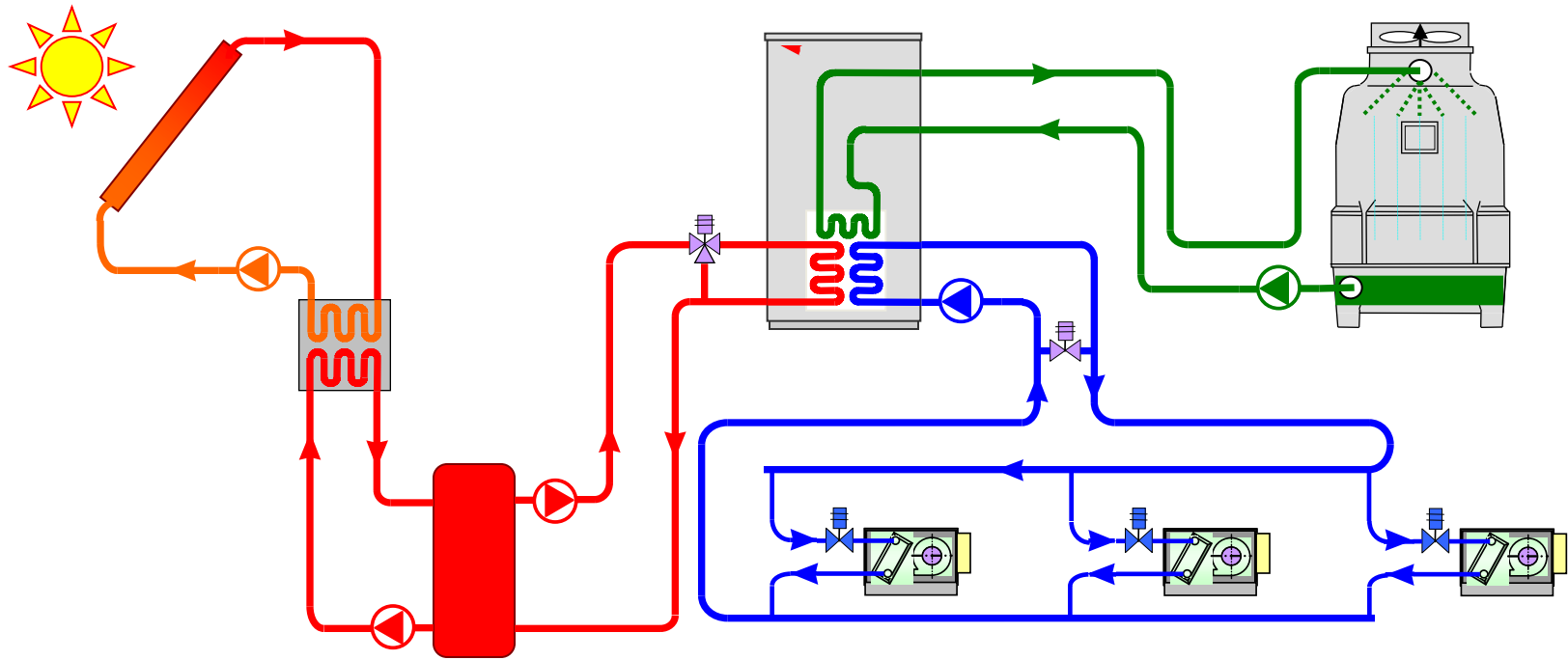
Typical Payback summary



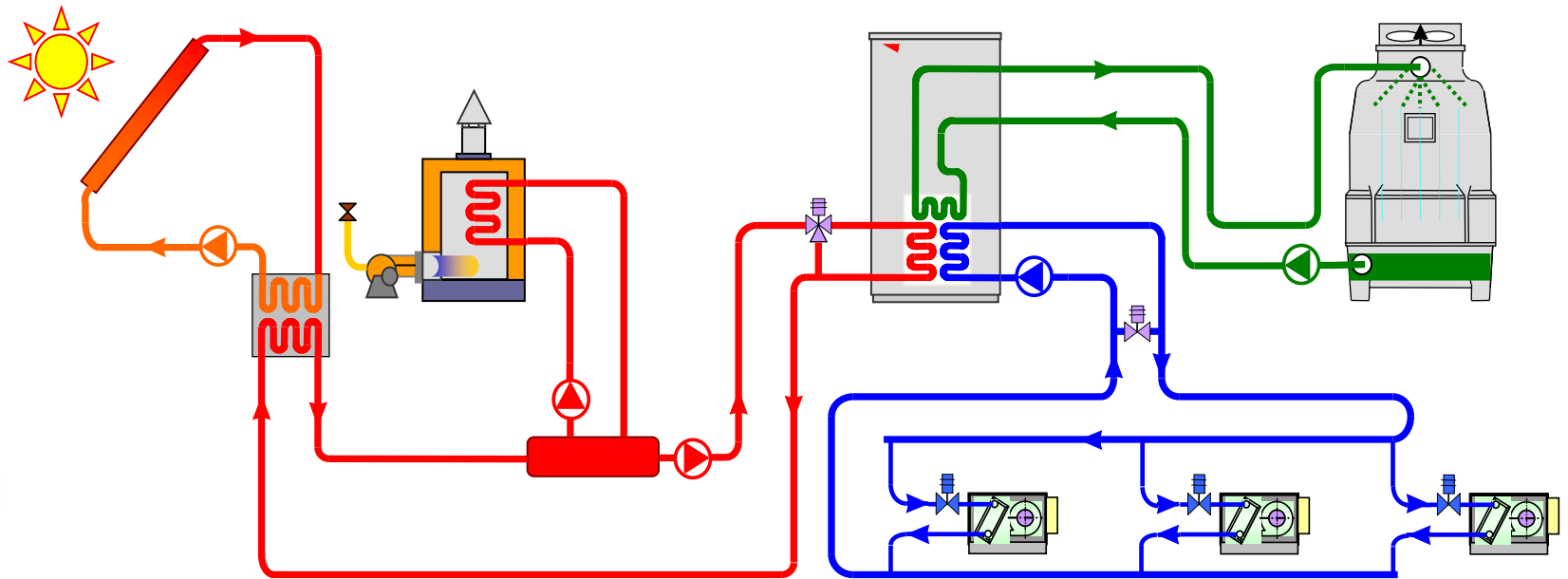
- Solar cooling system can cost 50% more than a conventional system
- Operating costs will be as little as 50% of conventional system
- However, where power costs are low and no subsidies exist, paybacks will be extended
- Payback period may often exceed life of components in the system
- Paybacks can potentially be improved by utilising waste heat productively (reducing water usage and eliminating need for water tower)



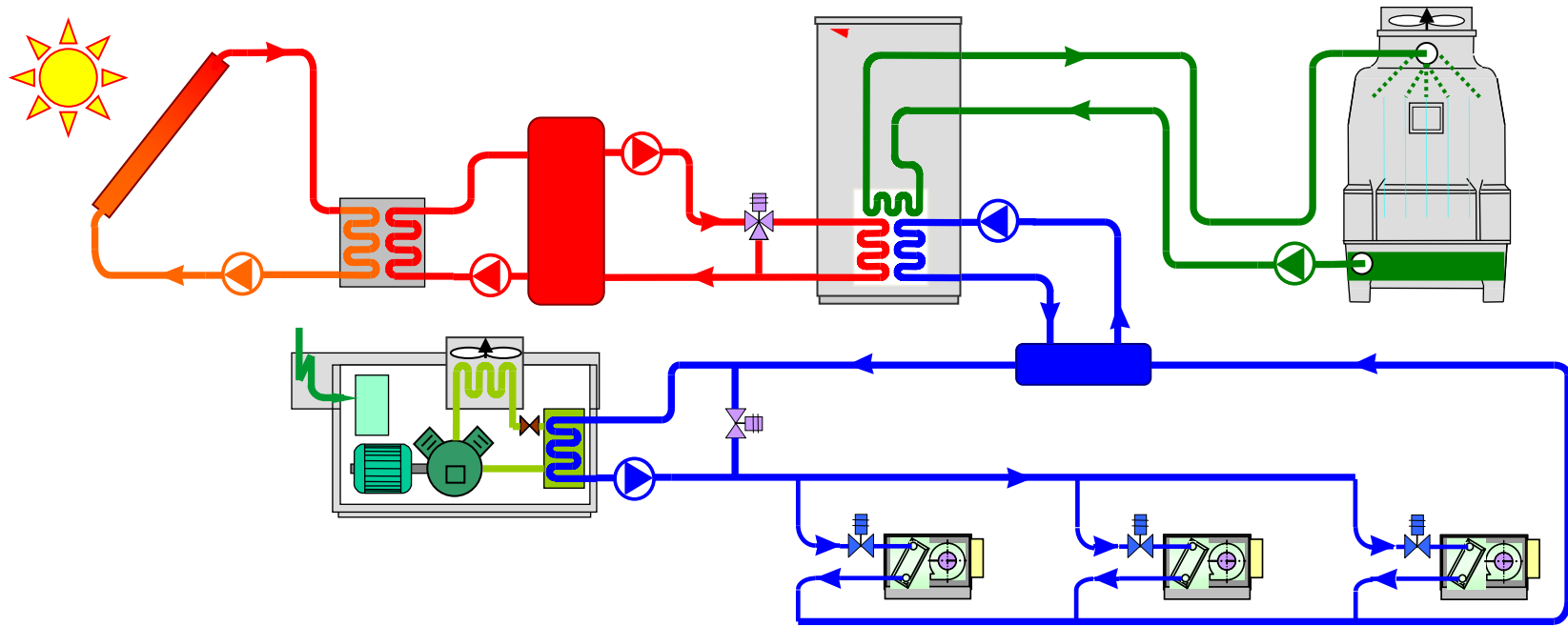
System Solutions – Cooling



System Solutions – Cooling



System Solutions – Cooling



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