

OVERVIEW & OBJECTIVES

Power generation is a sector requiring great amounts of water. Cooling water for electricity production accounts for 45% of total water abstraction in European Union, second only to agriculture sector. MATCHING goal is the reduction of cooling water demand in the energy sector through innovative technological solutions, to be demonstrated in thermal and geothermal power plants.

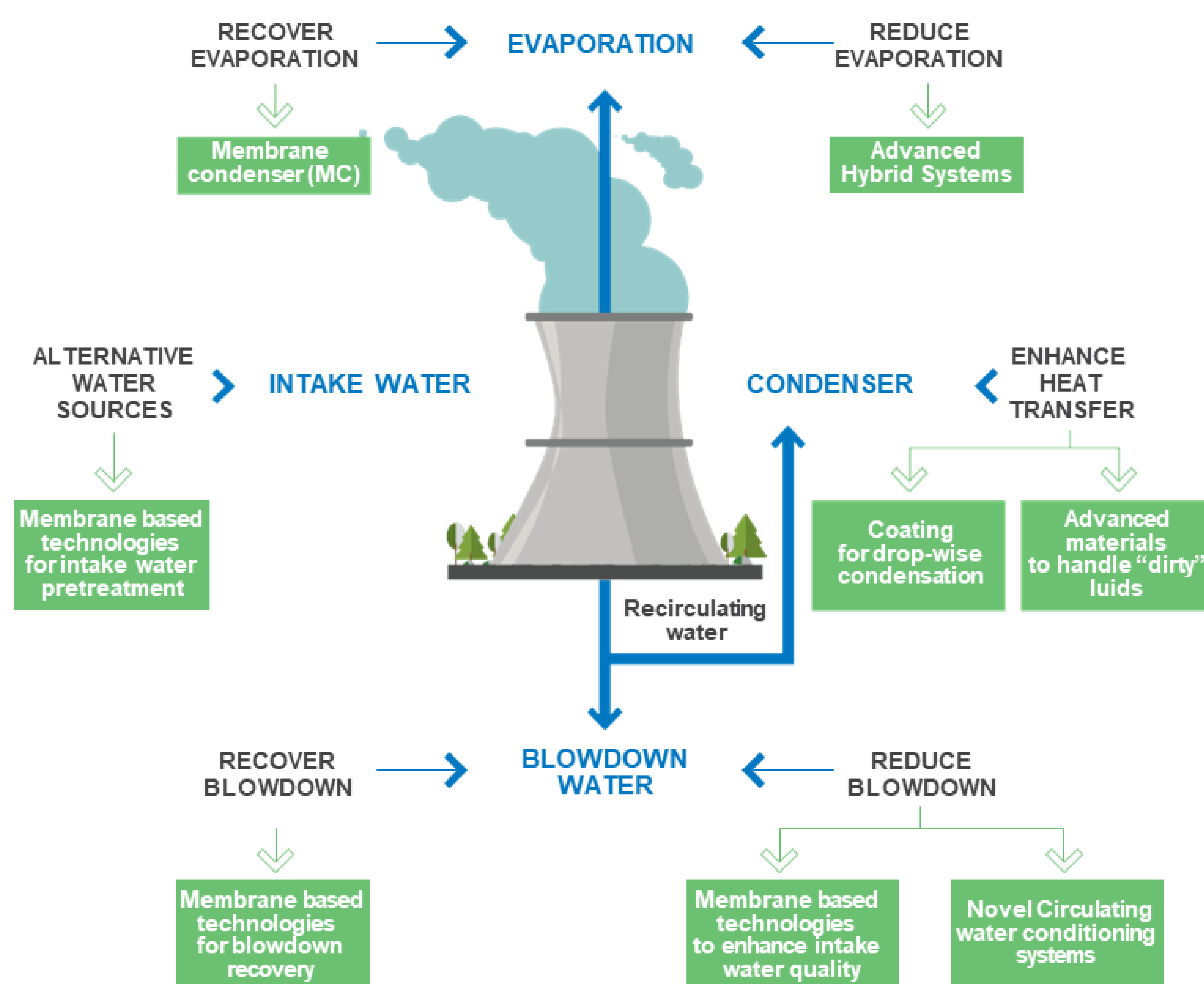
Technologies

Hybrid Cooling Systems with advanced CT filling media and anti-corrosion coatings in the dry section for high-T geothermal cooling tower to reduce evaporative losses.

Stainless steel with biocide proprieties and antifouling coatings, to be applied on the cooling water side of condenser tube bundles to enhance the condenser robustness and allow the use of alternative cooling fluids.

Coatings with high hydrophobic functionality and surface texturing techniques on the steam side of condenser tube bundles, are under investigation to promote drop-wise condensation enhancing heat-transfer efficiency.

Innovative membrane-based technologies are being developed for cooling water conditioning and/or for water recovery as: Membrane capacitive deionization (MCDI), Vortex degasification technology (VPT), Membrane distillation (MD), Microfiltration (MF), Ultrafiltration (UF), Nanofiltration (NF), Reverse Osmosis (RO). Membrane Condensers (MC) for water recovery from vapors.



GEOTHERMAL APPLICATIONS

High T geothermal source- Hybrid CT

One of the 6 CTs in Nuova San Martino geothermal plant (EGP site) is going to be retrofitted in hybrid configuration. Four different materials for the dry section and an advanced filling media will be tested during one year demonstration.



ADVANCED MATERIALS TO IMPROVE HEAT TRANSFER IN STEAM CONDENSER

Laboratory test on antibiofouling and fouling-release coatings, biocide stainless steels, coatings high hydrophobic functionality and surface texturing techniques have been completed with encouraging results. Next steps are the test in THRYCO and PERCLES, two pilots belonging to EDF, and finally the long run test in Endesa As Pontes PP.



Low T –geothermal source – Coatings

Different combinations of coatings/substrates capable to work with aggressive geothermal brine have been selected for the test at Balmatt (VITO site) to work under real conditions.



TECHNOLOGIES FOR COOLING TOWER WATER CONDITIONING

Membrane Distillation is one of the technologies for water treatment that are under investigation in MATCHING.

After the completion of 3 months testing coupled with ENGIE MERADES pilot cooling tower it will be demonstrated in As Pontes Endesa PP for one year. The same technology coupled with UF/RO will be tested in ENEL Civitavecchia PP for the recovery of FGD waste water.

