MITA Cooling Technologies
for Environmental Sustainability

With this document, **MITA Cooling Technologies** (MITA CT) aims to state its commitment and plans for sustainability; furthermore, it aims to describe how its products interact with the environment by helping to reduce:

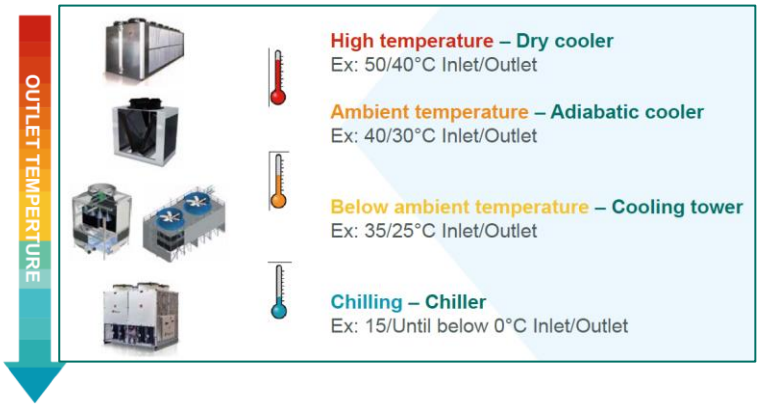
- energy use;
- the use of water for cooling;
- CO2 emissions into the atmosphere.

Some best practices that we believe are necessary and consistent to talk about sustainability:

- since 2011, 65% of energy used in our Siziano (PV) plant has been self-produced from renewable sources;
- having achieved **ISO 14001** certification. We work with an appropriate management system to keep the environmental impacts of our activities under control, systematically seeking improvement;
- manage cooling water (mainly in production settings), always in a **"circular"** manner (Ch. 2), reducing its consumption and reusing available resources;
- use water while always respecting its **natural cycle** (Ch. 3);
- act every day as cooling advisors, suggesting the technological solution (**air, adiabatic and evaporative cooling**) that meets the customer's needs and is efficient and sustainable in the context in which it is to be inserted (Ch. 4);
- be able to determine and provide the **carbon footprint** of each of our products (further discussed in Ch. 5);
- having activated an internal process to promote **remanufactured products** with a low environmental impact, thanks to the application of circular economy principles (further discussed in Ch. 5).

1. Different cooling principles

MITA Cooling Technologies designs, manufactures and markets devices that exploit **four different technologies** useful for lowering the temperature of cooling fluids in a wide variety of production processes, **significantly reducing water and energy use**:



- air coolers / condensers;
- air coolers / condensers / subcoolers (R744) with adiabatic supply (adiabatic dry coolers);
- cooling towers (open & closed circuits) / evaporative condensers (NH3),
- mechanical liquid coolers (compression refrigeration units).

Dry cooler (air cooler), for return temperatures of the fluid to be cooled (minimum achievable) close to room temperature.

- No use of water to facilitate heat transfer (i.e., cooling of the process fluid).
- 100% use of electricity to move air (the only cooling carrier) through one or more fans.

Adiabatic dry cooler (air cooler with adiabatic supply), for fluid return temperatures (minimum achievable) about 5°C below room temperature.

- Minimal water use (adiabatic operation only), useful for facilitating heat transfer (i.e., cooling of the process fluid.
- Optimized energy use (higher efficiency due to adiabatic supply).
- Smaller installation space compared to 100% air solution.

Evaporative cooler (open- & closed-circuit cooling tower and evaporative condensers for NH3), for fluid return temperatures (minimum achievable) about 10°C below ambient temperature.

- Water use for efficient heat transfer (i.e., cooling of the process fluid).
- Low and further optimizable energy use.
- Extremely small installation spaces.

Mechanical liquid cooler (compression refrigeration unit), for fluid return temperatures (minimum achievable) even below 0°C.

- Use of electrical energy only for refrigerant gas compression and the use of one or more fans for the refrigerant condensing phase (in the case of air-cooled machines); possibility of "free-cooling" solutions.
- Electricity use for refrigerant gas compression and water for the condensing phase of refrigerant gas (in the case of water-cooled machines).
- Extremely small installation spaces.

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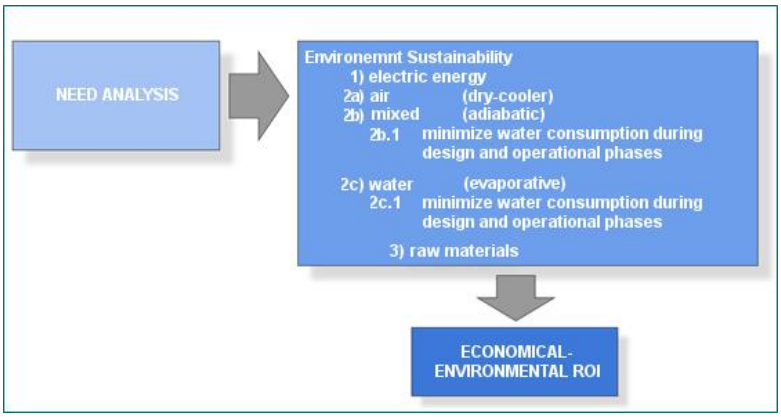
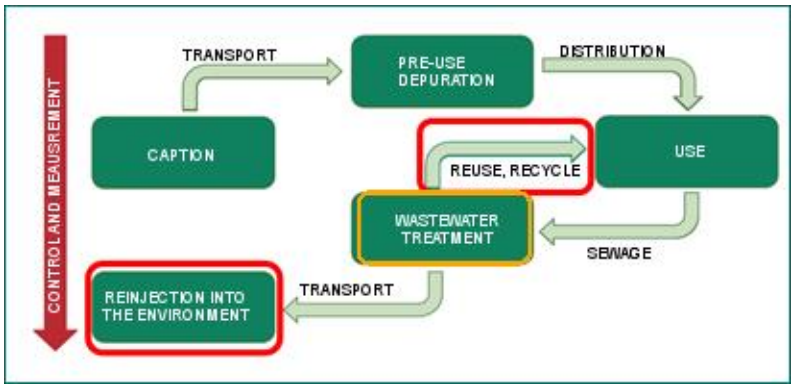
2. Water used in a "circular" manner.

Water is the **process fluid to be cooled** and the useful element to increase plant efficiency. We manage water in a "**CIRCULAR**" way, that is, by suggesting useful solutions for its utilization and subsequent recovery, according to the following scheme:



[*WATER MANAGEMENT REPORT 2019 novembre. Le sfide per l'efficienza idrica | energystrategy.it (Polimi)]*
1] Reduce consumption
1a] Use different carriers than water, where possible
1b] Reduce water use and waste within processes
2] Keep resources in circulation
2a] Reuse water internally within implemented processes
2b] Purify and recycle water
3] Regenerate natural capital
3a] Purify and re-inject the water resource into the environment



The systems proposed by MITA Cooling Technologies are located within the boxes highlighted in red. Wastewater treatment (part highlighted in yellow), on the other hand, is handled by another company part of the MITA Group (www.mitagroup.it): **MITA Water Technologies** (www.mitawatertechnologies.com).

The goal is to make human use of the water resource as close as possible to the natural water cycle.

3. The natural water cycle in the case of adiabatic and evaporative cooling

Adiabatic cooling

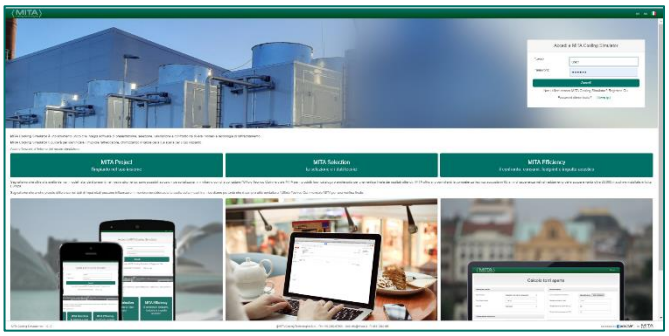
- Approximately 0.2 percent of the mass to be cooled evaporates, thus returning to the environment (typically in mid-warm periods a specific section is sprayed with water to reduce the air temperature).

Evaporative cooling

- About 2% of the mass to be cooled evaporates, thus returning to the environment.
- About 1 percent of the mass to be cooled is disposed of in the network to maintain the correct concentration of salts in the circuit. The determination of this value is closely related to the quality of the treated water.
- For more information: https://www.mitacoolingtechnologies.com/risorse/articoli-tecnici/trattamento-acque-per-torri-di-raffreddamento/

4. The importance of advice and a wide range of cooling technologies

We analyze and select the most suitable solution and service to improve the environmental impact in cooling production processes, always evaluating performance, efficiency and savings, as promoting sustainability is part of our corporate commitment. In pursuit of this goal, we also enlist the support of **advanced software** developed to facilitate comparisons and optimizations between different products, using data (e.g., location temperature databases) that are always up-to-date and above board.



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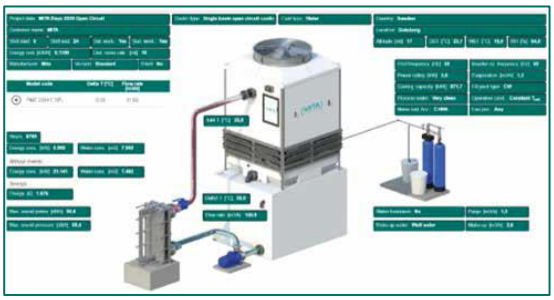
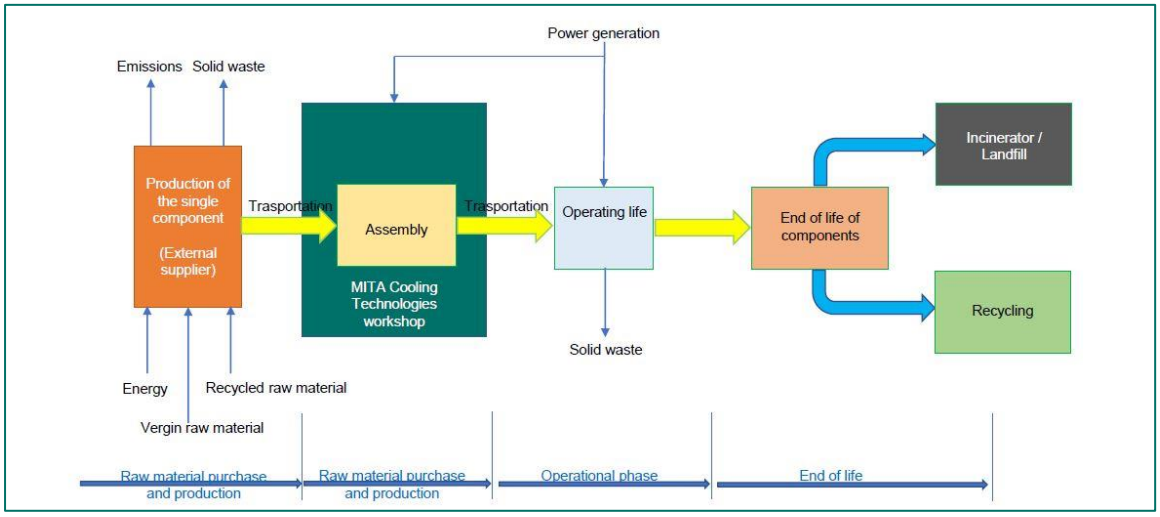


5. Remanufactured products and carbon footprint.

MITA Cooling Technologies is focusing on a careful choice of materials to be used in the construction of its machines, looking for components that can facilitate their recycling at the end of their life.
We have outlined an internal process for handling **remanufactured products**, making sure that this option is also part of our offering, thus adding **carbon footprint** (*) to the analysis of the most optimized solution.
All projects can be accompanied by LCA analysis, electrical consumption and water management and use.
We suggest for all machines management via PLC (inverter system - for savings in the order of 80% over lifetime) and complete water treatment systems.
MITA CT engages its key suppliers to work on production processes with the goal of:

- ✓ reduce the energy used in their production,
- ✓ increase the renewable component (self-produced or purchased),
- ✓ increase the second raw material component.

By way of example only, a schematic of the life cycle of an open circuit cooling tower, PME-E K19 series, is provided below.



(*) Carbon footprint calculated in accordance with UNI EN ISO-14067:2018 (GHG Greenhousegases).