E&T can provide several Green Energies systems as per Client needs, all the solution are tailored on the specific client requests. Actually our offer is based on the following systems:

®SOLAR THERMAL SYSTEMS

®THE HEAT PUMP

®ACCUMULATION SYSTEMS

®ROLL-BOND CONDENSERS

®SOLAR THERMAL SYSTEMS

The solar thermal panel is a device that converts solar radiation into thermal energy for the production of hot water and / or heating. It is different from the photovoltaic solar panel, used for the production of electricity. It is basically composed of a panel, an exchanger and a tank, which respectively serve to capture solar energy, circulate it and then store it. There are 2 types of thermal solar panels:

1) Natural circulation solar panels exploit the convention, that is, they give their heat to the water of the hydraulic system thanks to the different weight of the carrier liquid present in the storage tank. This type of solar panel is suitable for families with low savings.
2) Forced circulation solar panels, on the other hand, exploit the pumps to obtain the circulation of the carrier fluid, and are suitable for areas with harsh climates and for families with a high "energy saver" profile.

There are different types of solar thermal panels, including:

- Flat thermal solar panels without glass (without glass), which have the advantage of being inexpensive and with an excellent performance as long as the solar irradiation conditions are optimal: they are therefore suitable for seasonal use or in well-sunny areas.
- Thermal glazed solar panels, which have a lower efficiency than non-glazed in optimal conditions but ensure hot water production even in the cold months.
- Flat air thermal solar panels, which differ from the foregoing since they use air circulation instead of water.
- Flat solar thermal panels under vacuum, even better than those with air because they provide greater energy input even in unfavourable environmental conditions.

®THE HEAT PUMP

The heat pump (or heat pump) is a thermal machine capable of transferring thermal energy from a source at a lower temperature to a source at a higher temperature, using different forms of energy, generally mechanical.

Common examples of machines of this type are:

- Chiller
- Air conditioner
- Gas compression heat pump
- Absorption heat pump
- Phase change heat pump
- Thermoelectric heat pump with Peltier effect
- Heat pump with geothermal exchange
- Vortex, also called Ranque-Hilsch tube

It should be noted that, in the air conditioning field, the term heat pump is specifically referred to an air conditioner with reversible valve, which changes the direction of flow of the refrigerant fluid and thus allows both to make and to extract heat from a room in a building.

Heat pumps work thanks to different physical principles, but they are classified according to their application (heat transfer, heat source, heat sink or refrigerating machine).

Imagine 100 units of thermal energy inside a balloon, this is compressed until you reach the size of a ping pong ball. The temperature of the air inside is increased because the work done for compression, for example 100 units, has produced an increase in thermal energy. In the ideal case of adiabatic compression, without exchanging heat with the external environment, the energy inside the ball is now 200 units. Otherwise it will be lower, however between 100 and 200 units.

The walls of the ball are heated and then the heat begins to move outside. To bring this heat to another place, one can imagine moving the ball in a cold area, where it will gradually vary its temperature to equal the ambient temperature: in this process it is assumed that it transfers 50 units of thermal energy.

After the ball has cooled down, you can bring it back to the starting area and let it expand. Since it has lost heat, when it returns to the size of a balloon its temperature is too low and therefore begins to absorb thermal energy, cooling the surrounding air.

The compressor of a heat pump creates just the difference in pressure that allows the cycle to work (similarly to the ball that expands and contracts): it sucks the refrigerant fluid through the evaporator, where the fluid itself evaporates at low pressure by absorbing heat, compresses it and pushes it inside the condenser where the fluid condenses at high pressure, releasing the absorbed heat. After the condenser,

the fluid passes through the lamination valve which brings it into liquid / vapor condition (reduce fluid pressure), then re-enter the evaporator by restarting the cycle. The refrigerant fluid changes state inside the two exchangers: it passes in the evaporator from liquid to gaseous, in the condenser from gaseous to liquid.

®ACCUMULATION SYSTEMS

a) For photovoltaic systems

They consist of particular "batteries", designed and designed to store the energy produced by a photovoltaic system, so as to make it available for use when the plant is not able to produce sufficient energy for self-consumption, for example night, or to store and stock the self-produced surplus of energy in the "stand alone" plants that feed places not served by the national network. The advantages in a storage system Using a storage system for your photovoltaic system allows us to obtain numerous advantages:

- is able to considerably reduce the impact on electricity costs (savings in the bill)
- is able to make the electric user self-sufficient
- is able, with design measures, to have electricity optimized for the privileged load

b) For integrated into a Grid Connected system

it allows to increase the deferred self-consumption, that is the possibility to accumulate the electricity produced through the batteries and use it at a later time, for example in the evening, when the photovoltaic does not produce. In grid connected systems with accumulation batteries, consumption flows follow a specific order. Using a storage system for your photovoltaic system allows us to obtain numerous advantages: the user draws, in the first place, from the current produced by the photovoltaic panels. If, at the time of the request for the supply of electricity, the system does not produce, the user draws on the energy stored in the accumulation system (batteries). When the batteries are low, the user takes the energy from the national electricity supply service. Unlike when it happens with the stand-alone system, which can function as a continuity unit, grid connected systems, even if equipped with an accumulation system, have a safety system that automatically deactivates the system in case of absence voltage supply.

c) For Production or post production

Storage systems can be of two types: On the production side, installed between the photovoltaic system and the inverter. Post production, installed after the inverter. The production-side systems consist of a single inverter installed on the direct current side that simultaneously controls the system and the

batteries. They have less losses due to the transformation of electricity. Post-production systems have almost the same operation, but are installed downstream of the inverter on the alternating current side. A kit consisting of a second inverter and batteries is added to the system. They present a greater energy dispersion but it is a convenient solution for those already in possession of a photovoltaic system, as it can be integrated without having to replace the existing inverter.

d) For a Grid Connected system

In a Grid Connected system we can distinguish in particular two storage systems: Accumulation system with integrated inverter: includes inside the same container the inverter to transform direct current into alternating current and batteries for energy storage. Advantages: they are compact, with a small footprint and easy to install on systems of new realization Independent storage systems: inverters and batteries are separated from each other. Advantages: configurable in a more precise way according to the customer's load profiles; in fact, the technician can choose between different technologies and storage capacities. the user draws, in the first place, from the current produced by the photovoltaic panels.

If, at the time of the request for the supply of electricity, the system does not produce, the user draws on the energy stored in the accumulation system (batteries). When the batteries are low, the user takes the energy from the national electricity supply service. Unlike when it happens with the stand-alone system, which can function as a continuity unit, grid connected systems, even if equipped with an accumulation system, have a safety system that automatically deactivates the system in case of absence voltage supply.

®ROLL-BOND CONDENSERS

Aluminium exchanger ROLL-BOND. Composed of a sandwich of two aluminium sheets between which a channel is obtained with a suitable shape where the exchange fluid (either gas or liquid) is circulated, the ROLL-BOND is an excellent heat exchanger that guarantees 100% of primary exchange thanks to the high thermal conductivity of aluminium. The production flexibility of the technology used makes it possible to create a large number of different types of ducting, making the ROLL-BOND suitable for every use. It can be easily worked, folded, cut, painted and adapted to any application context required. These characteristics favour its use as an exchange element in many applications.